

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 Y
Edition : 7.10.86
replaces : 9.85
Calibrating oil : ISO-4113

Injection pump : VE 4/11F1150 R140
Type number : 0 460 414 009

Customer-specific information
Customer : IHC

Engine : DT 239/856

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2+-0,02
(from BDC): (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800
Charge press. hPa: 800
Setting value mm: 4,5...4,9

Supply-pump pressure:

Speed 1/min: 800
Charge press. hPa: 800

A01

Setting value bar: 5,3...5,9

Full-load del. with charge press.:

Speed 1/min: 800
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 92,2...93,2
Dispersion cm³/
1000H.: 3,5
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm³/
1000H.: 75,5...77,5

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm³/
1000H.: 23,0...27,0
Dispersion cm³/
1000H.: 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1270
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 22,0...28,0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del. quantity mind.
cm³/1000H.: 100

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
Charge press. hPa: 800
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 800
Charge press. hPa: 800
TD travel mm: -
mm: (4,5...4,9)
3rd speed 1/min: 1150
Charge press. hPa: 800
TD travel mm: 5,3...6,0
mm: (5,0...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Charge press. hPa: 800
Supply-pump pressure bar: 3,7...4,3
2nd speed 1/min: 1150
Charge press. hPa: 800
Supply-pump pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 55...138
quantity cm3/10s: (40...153)
2nd speed 1/min: 1150
Charge press. hPa: 800
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
Charge-air pressure-setting point hPa: 300
LDA stroke mm: 4,9
Del. quantity cm3/: 86,4...90,4
1000H.: -
2nd speed 1/min: 1300
Charge press. hPa: 800
Del. quantity cm3/: -
1000H.: 0...2,5
3rd speed 1/min: 1270
Charge press. hPa: 800
Del. quantity cm3/: -
1000H.: (21,5...29,5)
4th speed 1/min: 1230
Charge press. hPa: 800
Del. quantity cm3/: 66,0...74,0
1000H.: (65,5...74,5)
5th speed 1/min: 1130
Charge press. hPa: 800
Del. quantity cm3/: 85,4...88,4
1000H.: (84,3...98,5)
6th speed 1/min: 800
Charge press. hPa: 800
Del. quantity cm3/: -
1000H.: (90,1...95,3)
7th speed 1/min: 800
Charge press. hPa: 300
Del. quantity cm3/: -
1000H.: (85,0...91,8)
8th speed 1/min: 500
Charge press. hPa: 230
Del. quantity cm3/: 83,5...84,5
1000H.: (81,4...86,6)
9th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm3/: -
1000H.: (73,9...79,1)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del. quantity cm3/: -
1000H.

Electr. shutoff:
Speed 1/min: 1150
ELAB volt: -
Del. quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del. quantity cm3/: -
1000H.: (20,5...29,5)
2nd speed 1/min: 400
Del. quantity cm3/: 5,0...11,0
1000H.: (3,5...12,5)
3rd speed 1/min: 450
Del. quantity cm3/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 220
Del. quantity cm3/: -
ind. 1000H: 100,0
2nd speed 1/min: 300
Del. quantity cm3/: -
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,4
MS	mm	:	1,2...1,4
SVS max.	mm	:	5,0
XK	mm	:	20,2...22,2
XL	mm	:	12,3...15,7

Remarks:

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 4,0 H
Edition : 30.9.86
replaces : 7.84
Calibrating oil : ISO-4113

Injection pump : VE 4/11F1100 R94-1
Type number : 0 460 414 011

Customer-specific information
Customer : STEYER

Engine : WD 411.89/90

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Setting value mm: 5,2... 5,6

Supply-pump pressure:

Speed 1/min: 1000
Setting value bar: 5,2...5,8

Full-load del. w/out charge press.:

Speed 1/min : 1000
Del.quantity cm3/
1000H.: 73,5...74,5
Dispersion cm3/: 3,0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 300
Del.quantity cm3/
1000H.: 11,5...15,5
Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm3/
1000H.: 50,0...56,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 1100
TD travel mm: 5,9...6,7
mm: (5,6...7,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,8...3,4
2nd speed 1/min: 1100
Supply-pump
pressure bar: 5,7...6,3

Overflow quantity at overflow valve:

1st speed 1/min: 1100
Oveflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1270
Del.quantity cm3/: -
1000H.: 0...2,0
2nd speed 1/min: 1200
Del.quantity cm3/: 14,0...22,0
1000H.: (13,5...22,5)
3rd speed 1/min: 1150
Del.quantity cm3/: -
1000H.: (48,5...57,5)
4th speed 1/min: 1080
Del.quantity cm3/: 72,5...74,5
1000H.: (70,8...76,2)
5th speed 1/min: 1000

Del. quantity cm³/: -
1000H.: (71,3...76,7)
6th speed 1/min: 500
Del. quantity cm³/: 66,0...70,0
1000H.: (64,6...71,4)

Zero delivery (stop):
1000H.

Idle delivery:

1st speed 1/min: 300
Del. quantity cm³/: -
1000H.: (9,0...18,0)
2nd speed 1/min: 340
Del. quantity cm³/: -
1000H.: 0...1,5
3rd speed 1/min: 400
Del. quantity cm³/: -
1000H.: 0...1,0

Automatic starting fuel delivery:

1st speed 1/min: 170
Del. quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 250
Del. quantity cm³/: -
ax. 1000H: 65,0

Shutoff electromagnet:

Cut-in
min. voltage : -
Rated voltage : -

Mounting and assembly dimensions:

Designation

K	mm	: 3,2-3,4
KF	mm	: 5,2-5,5
MS	mm	: 0,9-1,1
SVS max.	mm	: 4,0

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 Y6
Edition : 12.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1090 R176
Type number : 0 460 414 016

Customer-specific information
Customer : IHC

Engine : D239-E833

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): +0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800
Setting value mm: 4,8...5,2

Supply-pump pressure:

Speed 1/min: 800
Setting value bar: 5,1...5,7

Full-load del. w/out charge press.:

Speed 1/min : 800
Del.quantity cm3/
1000H.: 81,5...82,5
Dispersion cm3/: 3,5
1000H.: (4,0)

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm3/
1000H.: 21,5...25,5
Dispersion cm3/: 3,5
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1200
Del.quantity cm3/
1000H.: 12,0...18,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 100

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
TD travel mm: 1,7...2,5
mm: (1,4...2,8)
2nd speed 1/min: 800
TD travel mm: -
mm: (4,3...5,7)
3rd speed 1/min: 1050
TD travel mm: 5,4...6,2
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Supply-pump
pressure bar: 3,5...4,1
2nd speed 1/min: 1050
Supply-pump
pressure bar: 6,0...6,6

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...138
quantity cm3/10s: (40...153)
2nd speed 1/min: 1090
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1270
Del. quantity cm³/: -
1000H.: 0...2,0
3rd speed 1/min: 1200
Del. quantity cm³/: -
1000H.: (10,5...19,5)
4th speed 1/min: 1150
Del. quantity cm³/: 47,0...53,0
1000H.: (45,5...54,5)
5th speed 1/min: 1050
Del. quantity cm³/: 78,5...81,5
1000H.: (77,4...82,6)
6th speed 1/min: 800
Del. quantity cm³/: -
1000H.: (79,4...84,6)
7th speed 1/min: 650
Del. quantity cm³/: 75,0...79,0
1000H.: (73,6...80,4)
8th speed 1/min: 500
Del. quantity cm³/: 65,5...69,5
1000H.: (64,1...70,9)

Zero delivery (stop):

1000H.

Idle delivery:

1st speed 1/min: 350
Del. quantity cm³/: -
1000H.: (19,0...28,0)
2nd speed 1/min: 400
Del. quantity cm³/: 4,5...10,5
1000H.: (3,0...12,0)
3rd speed 1/min: 460
Del. quantity cm³/: -
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 220
Del. quantity cm³/: -
ind. 1000H: 100,0
2nd speed 1/min: 300
Del. quantity cm³/: -
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : -
Rated voltage : -

Mounting and assembly dimensions:

Designation

K mm : -
KF mm : 5,1...5,4

MS

SVS max.

mm : 1,0...1,25

mm : 3,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 C
Edition : 3.12.86
replaces : 4.86
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1900 L217
Type number : O 460 414 027

Customer-specific information
Customer : VOLVO PENTA

Engine : TAMD 31

Power k: 95

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value bar: 6,1...6,7

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 93,5...94,5
Dispersion cm³/
1000H.: 5,0
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min: 650
Del. quantity cm³/
1000H.: 58,5...59,5

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm³/
1000H.: 23,0...27,0
Dispersion cm³/
1000H.: 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 2100
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 31,0...37,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 100

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 0,9...1,7
mm: (0,6...2,0)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: -
mm: (3,8...5,2)
3rd speed 1/min: 1900
Charge press. hPa: 1000
TD travel mm: 6,1...6,9
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000

Supply-pump
pressure bar: 2,7...3,3
2nd speed 1/min: 1900
Charge press. hPa: 1000
Supply-pump
pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 700
Charge press. hPa: -
Overflow : 46...83
quantity cm³/10s: (21...98)
2nd speed 1/min: 1900
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
Charge-air pressure-setting
point hPa: 300
LDA stroke mm: 6,4
Del. quantity cm³/
1000H.: (81,3...86,7)
2nd speed 1/min: 2230
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 0...3,0
3rd speed 1/min: 2100
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (29,5...38,5)
4th speed 1/min: 2050
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (67,0...77,0)
1000H.: (67,5...76,5)
5th speed 1/min: 1900
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (81,8...87,2)
6th speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (91,3...96,7)
7th speed 1/min: 1200
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (95,8...101,2)
8th speed 1/min: 700
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (94,6...101,4)
9th speed 1/min: 650
Charge press. hPa: -
Del. quantity cm³/
1000H.: (56,3...61,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm³/: -
1000H.

Electr. shutoff:

Speed 1/min: 1090
ELAB volt: 12,0
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del. quantity cm³/: -
1000H.: (20,5...29,5)
2nd speed 1/min: 400
Del. quantity cm³/: 7,0...13,0
1000H.: (5,5...14,5)
3rd speed 1/min: 480
Del. quantity cm³/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 400
Del. quantity cm³/: -
ind. 1000H: 74,0
2nd speed 1/min: 500
Del. quantity cm³/: -
ax. 1000H: 72,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,5
MS	mm	:	1,2...1,4
SVS max.	mm	:	3,8
XK	mm	:	18,8...20,8
XL	mm	:	14,3...17,7

Remarks:

Pushing electromagnet.

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 A1
Edition : 4.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1625 L217-2
Type number : O 460 414 031

Customer-specific information
Customer : VOLVO PENTA

Engine : TAM 31

Power k: 31

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC) : $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 6,1...6,7

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del. quantity cm3/
1000H.: 83,5...84,5
Dispersion cm3/: 5,0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 350
Del. quantity cm3/
1000H.: 18,0...22,0
Dispersion cm3/: 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1800
Del. quantity cm3/
1000H.: 31,0...37,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 95,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100
TD travel mm: 0,9...1,7
mm: (0,6...2,0)
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,8...5,2)
3rd speed 1/min: 1625
TD travel mm: 5,0...5,8
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump pressure bar: 2,7...3,3
2nd speed 1/min: 1625
Supply-pump pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 700
Overflow quantity cm3/10s: 46...83
quantity cm3/10s: (21...98)
2nd speed 1/min: 1625
Overflow quantity cm3/10s: 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1970
Del. quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 1880
Del. quantity cm3/: 3,0...11,0
1000H.: (2,5...11,5)
4th speed 1/min: 1800
Del. quantity cm3/: -
1000H.: (29,5...38,5)
5th speed 1/min: 1750
Del. quantity cm3/: 53,0...61,0
1000H.: (52,5...61,5)
6th speed 1/min: 1625
Del. quantity cm3/: 78,5...81,5
1000H.: (77,3...82,7)
7th speed 1/min: 1500
Del. quantity cm3/: -
1000H.: (81,3...86,7)
8th speed 1/min: 1000
Del. quantity cm3/: 91,7...94,3
1000H.: (90,3...95,7)
9th speed 1/min: 800
Del. quantity cm3/: 90,0...93,0
1000H.: (88,1...94,9)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 1625
ELAB volt: 12,0
Del. quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del. quantity cm3/: -
1000H.: (15,5...24,5)
2nd speed 1/min: 400
Del. quantity cm3/: 4,0...10,0
1000H.: (2,5...11,5)
3rd speed 1/min: 450
Del. quantity cm3/: -
1000H.: 0...3,0

2nd speed 1/min: 600
Del. quantity cm3/: -
ax. 1000H.: 90,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-0T
MS	mm	:	1,2...1,45
SVS max.	mm	:	1,2
XK	mm	:	18,8...20,8
XL	mm	:	11,1...14,5

Remarks:

Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 A
Edition : 4.12.86
replaces : 4.86
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1900 L217-3
Type number : 0 460 414 032

Customer-specific information
Customer : VOLVO PENTA

Engine : TMD 31

Power k: 74

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 688 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 5,3...5,7

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value bar: 6,4...7,0

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 72,0...73,0
Dispersion cm³/
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min : 650
Del. quantity cm³/
1000H.: 54,0...55,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm³/
1000H.: 18,0...22,0

Full-load speed regulation:

Speed 1/min: 2150
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 12,0...18,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 90,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 1,5...2,3
mm: (1,2...2,6)

2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: -
mm: (4,8...6,2)

3rd speed 1/min: 1900
Charge press. hPa: 1000
TD travel mm: 6,3...7,1
mm: (6,0...7,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 2,9...3,5

2nd speed 1/min: 1900
Supply-pump pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 700
Charge press. hPa: -
Overflow quantity cm3/10s: (41...83)
2nd speed 1/min: 1900
Charge press. hPa: 1000
Overflow quantity cm3/10s: (55...138)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
Charge-air pressure-setting point hPa: 300
LDA stroke mm: 6,3
Del. quantity cm3/: 67,5...68,5
1000H.: (65,4...70,6)

2nd speed 1/min: 2220
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...3,0

3rd speed 1/min: 2150
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (10,5...19,5)

4th speed 1/min: 2100
Charge press. hPa: 1000
Del. quantity cm3/: 50,5...60,5
1000H.: (51,0...60,0)

5th speed 1/min: 1900
Charge press. hPa: 1000
Del. quantity cm3/: 67,5...70,5
1000H.: (66,4...71,6)

6th speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (69,9...75,1)

7th speed 1/min: 800
Charge press. hPa: 1000
Del. quantity cm3/: 73,0...76,0
1000H.: (71,1...77,9)

8th speed 1/min: 650
Charge press. hPa: -
Del. quantity cm3/: -
1000H.: (51,9...57,1)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del. quantity cm3/: -
1000H.:

Electr. shutoff:
Speed 1/min: 1900

ELAB volt: 12,0
Del. quantity cm3/: -
1000H.:

Idle delivery:

1st speed 1/min: 350
Del. quantity cm3/: -
1000H.: (15,5...24,5)
2nd speed 1/min: 400
Del. quantity cm3/: 4,5...10,5
1000H.: (3,0...12,0)
3rd speed 1/min: 450
Del. quantity cm3/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 400
Del. quantity cm3/: -
ind. 1000H: 70,0
2nd speed 1/min: 500
Del. quantity cm3/: -
ax. 1000H: 65,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,2...5,5
MS mm : 1,2...1,4
SVS max. mm : 3,8

Remarks:
Pushing electromagnet.

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,0 P1
Edition : 2.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1625 L111-3
Type number : 0 460 414 033

Customer-specific information
Customer : VOLVO-PENTA

Engine : TAMD 30 A

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): +0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 2,6...3,0

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 6,2...6,8

Full-load del. w/out charge press.:

Speed 1/min : 1500

Del. quantity cm³/
1000H.: 62,0...63,0
Dispersion cm³/: 3,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 325
Del. quantity cm³/
1000H.: 26,0...30,0
Dispersion cm³/: 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 2000
Del. quantity cm³/
1000H.: 6,0...14,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 0,5...1,3
mm: (0,2...1,6)
2nd speed 1/min: 1500
TD travel mm: -
mm: (2,1...3,5)
3rd speed 1/min: 1625
TD travel mm: 3,0...3,6
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 3,2...3,8
2nd speed 1/min: 1625
Supply-pump
pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 55...138
quantity cm³/10s: (40...153)
2nd speed 1/min: 1625
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:
1st speed 1/min: 2100

Del. quantity cm³/: -
 1000H.: 0...2,0
 2nd speed 1/min: 2000
 Del. quantity cm³/: -
 1000H.: (5,5...14,5)
 3rd speed 1/min: 1800
 Del. quantity cm³/: 46,5...52,5
 1000H.: (45,0...54,0)
 4th speed 1/min: 1625
 Del. quantity cm³/: 58,5...61,5
 1000H.: (57,3...62,7)
 5th speed 1/min: 1500
 Del. quantity cm³/: -
 1000H.: (59,8...65,2)
 6th speed 1/min: 1000
 Del. quantity cm³/: 61,5...63,5
 1000H.: (59,8...65,2)
 7th speed 1/min: 600
 Del. quantity cm³/: 52,5...56,5
 1000H.: (51,1...57,9)

Zero delivery (stop):
 1000H.

Idle delivery:

1st speed 1/min: 325
 Del. quantity cm³/: -
 1000H.: (23,5...32,5)
 2nd speed 1/min: 450
 Del. quantity cm³/: -
 1000H.: 0...3,0
 3rd speed 1/min: 500
 Del. quantity cm³/: -
 1000H.: 0...1,0

Automatic starting fuel delivery:

1st speed 1/min: 350
 Del. quantity cm³/: -
 ind. 1000H: 70,0
 2nd speed 1/min: 450
 Del. quantity cm³/: -
 ax. 1000H: 65,0

Shutoff electromagnet:

Cut-in
 min. voltage : 20,0
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
 K mm : -
 KF mm : 5,7...6,0
 MS mm : 1,2...1,45
 SVS max. mm : 5,0

Remarks:
 Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 A2
Edition : 4.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1625 L217-4
Type number : 0 460 414 034

Customer-specific information
Customer : VOLVO PENTA

Engine : TAM 31

Power k: 81

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 6,1...6,7

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 83,5...84,5
Dispersion cm3/: 5,0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm3/
1000H.: 18,0...22,0
Dispersion cm3/: 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1800
Del.quantity cm3/
1000H.: 31,0...37,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 95,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100
TD travel mm: 0,9...1,7
mm: (0,6...2,0)
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,8...5,2)
3rd speed 1/min: 1625
TD travel mm: 5,0...5,8
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,7...3,3
2nd speed 1/min: 1625
Supply-pump
pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 700
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1625
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1970
Del.quantity cm³/: -
1000H.: 0...3,0
2nd speed 1/min: 1880
Del.quantity cm³/: 3,0...10,0
1000H.: (2,5...11,5)
3rd speed 1/min: 1800
Del.quantity cm³/: -
1000H.: (29,5...38,5)
4th speed 1/min: 1750
Del.quantity cm³/: 53,0...61,0
1000H.: (52,5...61,5)
5th speed 1/min: 1625
Del.quantity cm³/: 78,5...81,5
1000H.: (77,3...82,7)
6th speed 1/min: 1500
Del.quantity cm³/: -
1000H.: (81,3...86,7)
7th speed 1/min: 1000
Del.quantity cm³/: 91,7...94,3
1000H.: (90,3...95,7)
8th speed 1/min: 800
Del.quantity cm³/: 90,0...93,0
1000H.: (88,1...94,9)

Zero delivery (stop):
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm³/: -
1000H.: (15,5...19,5)
2nd speed 1/min: 400
Del.quantity cm³/: 4,0...10,0
1000H.: (2,5...11,5)
3rd speed 1/min: 450
Del.quantity cm³/: -
1000H.: 0...3,0

2nd speed 1/min: 600
Del.quantity cm³/: -
ax. 1000H: 90,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K mm : -
KF mm : K-3T
MS mm : 1,2...1,45
XK mm : 18,8...20,8
XL mm : 11,1...14,5

Remarks:

Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 E
Edition : 3.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1300 L251
Type number : 0 460 414 037

Customer-specific information
Customer : VOLVO-PENTA

Engine : TD 31

Power k: 49

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 6800 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,2
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 800
Setting value mm: 1,4...1,8

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 800
Setting value bar: 4,8...5,4

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 60,5...61,5
Dispersion cm³/
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 600
Del. quantity cm³/
1000H.: 47,0...48,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm³/
1000H.: 18,0...22,0
Dispersion cm³/
1000H.: -

Full-load speed regulation:

Speed 1/min: 1350
Charge press. hPa: 800
Del. quantity cm³/
1000H: 28,0...34,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900
Charge press. hPa: 800
TD travel mm: 0,2...1,0
mm: (0...1,3)
2nd speed 1/min: 1100
Charge press. hPa: 800
TD travel mm: -
mm: (0,9...2,3)
3rd speed 1/min: 1300
Charge press. hPa: 800
TD travel mm: 2,3...3,1
mm: (2,0...3,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 800

Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 1300
Charge press. hPa: 800
Supply-pump
pressure bar: 5,6...6,2

Overflow quantity at overflow valve:

1st speed 1/min: 600
Charge press. hPa: 800
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1300
Charge press. hPa: 800
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600
Charge-air pressure-setting
point hPa: 400
Del.quantity cm3/: 47,0...48,0
1000H.: (44,8...50,2)
2nd speed 1/min: 1450
Charge press. hPa: 800
Del.quantity cm3/: -
1000H.: 0...2,5
3rd speed 1/min: 1400
Charge press. hPa: 800
Del.quantity cm3/: 9,0...16,0
1000H.: (8,0...17,0)
4th speed 1/min: 1350
Charge press. hPa: 800
Del.quantity cm3/: -
1000H.: (26,5...35,5)
5th speed 1/min: 1250
Charge press. hPa: 800
Del.quantity cm3/: 60,5...63,5
1000H.: (59,3...64,7)
6th speed 1/min: 1100
Charge press. hPa: 800
Del.quantity cm3/: -
1000H.: (58,3...63,7)
7th speed 1/min: 600
Charge press. hPa: 800
Del.quantity cm3/: 50,0...53,0
1000H.: (48,1...54,9)
8th speed 1/min: 600
Charge press. hPa: -
Del.quantity cm3/: -
1000H.: (38,3...43,7)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 1300
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: -
1000H.: (15,5...24,5)
2nd speed 1/min: 380
Del.quantity cm3/: 5,0...11,0
1000H.: (3,5...12,5)
3rd speed 1/min: 420
Del.quantity cm3/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm3/: -
ind. 1000H.: 70,0
2nd speed 1/min: 450
Del.quantity cm3/: -
ax. 1000H.: 52,0

Shutoff electromagnet:

Cut-in
min. voltage : -
Rated voltage : -

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,7...6,0
MS	mm	:	1,2...1,45
SVS max.	mm	:	4,4

Remarks:

Correction at adjusting nut (46)

Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6 K
Edition : 18.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1350 R257
Type number : 0 460 414 039

Customer-specific information
Customer : FIAT-IVECO

Engine : 8040.25.200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,4
(from BDC) : +0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1000
Charge press. hPa: 1000

Setting value bar: 5,7...6,3

Full-load del. with charge press.:

Speed 1/min: 1000
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 93,5...94,5
Dispersion cm3/ : 3,5
1000H : (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm3/
1000H.: 68,5...69,5

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del. quantity cm3/
1000H.: 19,0...23,0
Dispersion cm3/ : 3,5
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1350
Charge press. hPa: 1000
Del. quantity cm3/
1000H: 85,0...88,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 90,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
Charge press. hPa: 1000
TD travel mm: 1,7...2,5
mm: (1,4...2,8)

2nd speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: -
mm: (3,3...3,7)

3rd speed 1/min: 1350
Charge press. hPa: 1000
TD travel mm: 6,3...7,1
mm: (6,0...7,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1000
Supply-pump
pressure bar: 3,6...4,2
2nd speed 1/min: 800
Charge press. hPa: 1000
Supply-pump
pressure bar: 4,8...5,4
3rd speed 1/min: 1350
Charge press. hPa: 1000
Supply-pump
pressure bar: 7,0...7,6

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1350
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 500
Charge-air pressure-setting
point hPa: 250
Del. quantity cm3/: 76,5...77,5
1000H.: (74,4...79,6)

2nd speed 1/min: 1600
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...2,5

3rd speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm3/: 16,0...22,0
1000H.: (14,5...23,5)

4th speed 1/min: 1400
Charge press. hPa: 1000
Del. quantity cm3/: 68,0...76,0
1000H.: (67,5...76,5)

5th speed 1/min: 1350
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (82,0...91,0)

6th speed 1/min: 1000
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (91,4...96,6)

7th speed 1/min: 500
Charge press. hPa: 1000
Del. quantity cm3/: 82,0...85,0
1000H.: (80,9...86,1)

8th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm3/: -
1000H.: (66,4...71,6)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 1350
Del. quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 400
Del. quantity cm3/: -
1000H.: (16,5...25,5)
2nd speed 1/min: 430
Del. quantity cm3/: 2,5...9,5
1000H.: (1,5...10,5)
3rd speed 1/min: 480
Del. quantity cm3/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 150
Del. quantity cm3/: -
ind. 1000H: 90,0

2nd speed 1/min: 230
Del. quantity cm3/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,5
MS	mm	:	1,3...1,55
SVS max.	mm	:	5,6
XK	mm	:	17,0...19,0
XL	mm	:	14,2...17,6

Remarks:

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6K1
Edition : 18.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1500 R264
Type number : 0 460 414 040

Customer-specific information
Customer : FIAT-IVECO

Engine : 8040.05.200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Setting value mm: 3,5...3,9

Supply-pump pressure:

Speed 1/min: 1000
Setting value bar: 4,5...5,1

Full-load del. w/out charge press.:

Speed 1/min : 1000
Del.quantity cm3/
1000H.: 55,0...56,0
Dispersion cm3/: 3,5
1000H.: (4,0)

Low-idle speed regulation:

Speed 1/min: 325
Del.quantity cm3/
1000H.: 7,0...11,0
Dispersion cm3/: 3,5
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1600
Del.quantity cm3/
1000H.: 38,0...44,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 65,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
2nd speed 1/min: 1000
TD travel mm: -
mm: (3,0...4,4)
3rd speed 1/min: 1300
TD travel mm: 5,8...6,4
mm: (5,4...6,8)
4th speed 1/min: 1500
TD travel mm: 6,2...7,0
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 700
Supply-pump
pressure bar: 3,3...3,9
2nd speed 1/min: 1500
Supply-pump
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 700
Overflow : 41...83
quantity cm3/10s: (26...98)

2nd speed 1/min: 1500
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1750
Del.quantity cm3/: -
1000H.: 0...2,5
3rd speed 1/min: 1650
Del.quantity cm3/: 15,5...24,5
1000H.: (15,5...24,5)
4th speed 1/min: 1600
Del.quantity cm3/: -
1000H.: (36,5...45,5)
5th speed 1/min: 1500
Del.quantity cm3/: 52,5...55,5
1000H.: (51,4...56,6)
6th speed 1/min: 1300
Del.quantity cm3/: 51,5...54,5
1000H.: (50,4...55,6)
7th speed 1/min: 1000
Del.quantity cm3/: -
1000H.: (52,9...58,1)
8th speed 1/min: 700
Del.quantity cm3/: 53,0...56,0
1000H.: (51,1...57,9)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1500
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 325
Del.quantity cm3/: -
1000H.: (4,5...13,5)
2nd speed 1/min: 360
Del.quantity cm3/: 1,5...7,5
1000H.: (0...9,0)
3rd speed 1/min: 420
Del.quantity cm3/: -
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 150
Del.quantity cm3/: -
ind. 1000H: 70,0
2nd speed 1/min: 230
Del.quantity cm3/: -
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0

Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,5
MS	mm	:	1,8...2,05
SVS max.	mm	:	-
XK	mm	:	17,0...19,0
XL	mm	:	13,1...16,5

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6 K2
Edition : 18.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1350 R268
Type number : 0 460 414 043

Customer-specific information
Customer : FIAT-IVECO

Engine : 8040.25R230

Power k: 74

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,4
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Setting value mm: 4,2...4,6

Supply-pump pressure:

Speed 1/min: 1000

Setting value bar: 5,1...5,7

Full-load del. w/out charge press.:

Speed 1/min : 800
Del.quantity cm³/1000H.: 82,5...83,5
Dispersion cm³/: 3,5
1000H.: (4,0)

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm³/1000H.: 22,0...26,0
Dispersion cm³/: 3,5
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1500
Del.quantity cm³/1000H.: 23,0...29,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm³/1000H.: 90,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
TD travel mm: 1,2...2,0
mm: (0,9...2,3)
2nd speed 1/min: 1000
TD travel mm: -
mm: (3,7...5,1)
3rd speed 1/min: 1200
TD travel mm: 5,7...6,3
mm: (5,3...6,7)
4th speed 1/min: 1350
TD travel mm: 6,2...7,0
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump pressure bar: 3,1...3,7
2nd speed 1/min: 700
Supply-pump pressure bar: 4,0...4,6
3rd speed 1/min: 1350
Supply-pump pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow quantity cm³/10s: 41...83
(26...98)
2nd speed 1/min: 1350
Overflow quantity cm³/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1600
Del.quantity cm³/: -
1000H.: 0...2,5
3rd speed 1/min: 1550
Del.quantity cm³/: 1,5...9,5
1000H.: (1,0...10,0)
4th speed 1/min: 1500
Del.quantity cm³/: -
1000H.: (21,5...30,5)
5th speed 1/min: 1350
Del.quantity cm³/: 72,0...75,0
1000H.: (70,9...76,1)
6th speed 1/min: 1250
Del.quantity cm³/: 75,2...77,8
1000H.: (73,9...79,1)
7th speed 1/min: 800
Del.quantity cm³/: -
1000H.: (80,4...85,6)
8th speed 1/min: 500
Del.quantity cm³/: 66,5...69,5
1000H.: (64,6...71,4)

Zero delivery (stop):
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm³/: -
1000H.: (19,5...28,5)
2nd speed 1/min: 400
Del.quantity cm³/: 3,0...9,0
1000H.: (1,5...10,5)
3rd speed 1/min: 460
Del.quantity cm³/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 150
Del.quantity cm³/: -
ind. 1000H.: 90,0
2nd speed 1/min: 230
Del.quantity cm³/: -
ax. 1000H.: 50,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation		
K	mm	: -
KF	mm	: 5,2...5,5
MS	mm	: 1,3...1,55
SVS max.	mm	: -
XK	mm	: 17,0...19,0
XL	mm	: 14,0...17,4

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 Y1
Edition : 10.12.86
replaces : 9.85
Calibrating oil : ISO-4113

Injection pump : VE 4/11F1150 R140-1
Type number : 0 460 414 049

Customer-specific information
Customer : IHC

Engine : DT 239/856

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800
Charge press. hPa: 800
Setting value mm: 4,5...4,9

Supply-pump pressure:

Speed 1/min: 800
Charge press. hPa: 800

Setting value bar: 5,3...5,9

Full-load del. with charge press.:

Speed 1/min: 800
Charge press. hPa: 800
Del. quantity cm3/
1000H.: 92,2...93,2
Dispersion cm3/ : 3,5
1000H.: (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm3/
1000H.: 75,5...77,5

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm3/
1000H.: 23,0...27,0
Dispersion cm3/ : 3,5
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1270
Charge press. hPa: 800
Del. quantity cm3/
1000H.: 22,0...28,0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del. quantity mind.
cm3/1000H.: 100

Inspection pump test specifications
Test specifications in parentheses

Timing device characteristic:

1st speed 1/min: 400
Charge press. hPa: 800
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 800
Charge press. hPa: 800
TD travel mm: -
mm: (4,5...4,9)
3rd speed 1/min: 1150
Charge press. hPa: 800
TD travel mm: 5,3...6,0
mm: (5,0...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Charge press. hPa: 800
Supply-pump
pressure bar: 3,7...4,3
2nd speed 1/min: 1150
Charge press. hPa: 800
Supply-pump
pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 55...138
quantity cm3/10s: (40...153)
2nd speed 1/min: 1150
Charge press. hPa: 800
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
Charge-air pressure-setting
point hPa: 300
LDA stroke mm: 4,9
Del. quantity cm3/ : 86,4...90,4
1000H.: -
2nd speed 1/min: 1300
Charge press. hPa: 800
Del. quantity cm3/ : -
1000H.: 0...2,5
3rd speed 1/min: 1270
Charge press. hPa: 800
Del. quantity cm3/ : -
1000H.: 21,5...29,5))
4th speed 1/min: 1230
Charge press. hPa: 800
Del. quantity cm3/ : 66,0...74,0
1000H.: (65,5...74,5)
5th speed 1/min: 1130
Charge press. hPa: 800
Del. quantity cm3/ : 85,4...88,4
1000H.: (84,3...98,5)
6th speed 1/min: 800
Charge press. hPa: 800
Del. quantity cm3/ : -
1000H.: (90,1...95,3)
7th speed 1/min: 800
Charge press. hPa: 300
Del. quantity cm3/ : -
1000H.: (85,0...91,8)
8th speed 1/min: 500
Charge press. hPa: 230
Del. quantity cm3/ : 83,5...84,5
1000H.: (81,4...86,6)
9th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm3/ : -
1000H.: (73,9...79,1)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: -
1000H.: (20,5...29,5)
2nd speed 1/min: 400
Del.quantity cm3/: 5,0...11,0
1000H.: (3,5...12,5)
3rd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 220
Del.quantity cm3/: -
ind. 1000H: 100,0
2nd speed 1/min: 300
Del.quantity cm3/: -
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,4
MS	mm	:	1,2...1,4
SVS max.	mm	:	5,0
XK	mm	:	20,2...22,2
XL	mm	:	12,3...15,7

Remarks:

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 Y7
Edition : 12.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1090 R176-1
Type number : 0 460 414 050

Customer-specific information
Customer : IHC

Engine : D239-E833

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC) : +0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800
Setting value mm: 4,8...5,2

Supply-pump pressure:

Speed 1/min: 800
Setting value bar: 5,1...5,7

Full-load del. w/out charge press.:

Speed 1/min: 800
Del. quantity cm³/
1000H.: 81,5...82,5
Dispersion cm³/
1000H.: (4,0)

Low-idle speed regulation:

Speed 1/min: 350
Del. quantity cm³/
1000H.: 21,5...25,5
Dispersion cm³/
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1200
Del. quantity cm³/
1000H.: 12,0...18,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 100

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
TD travel mm: 1,7...2,5
mm: (1,4...2,8)
2nd speed 1/min: 800
TD travel mm: -
mm: (4,3...5,7)
3rd speed 1/min: 1050
TD travel mm: 5,4...6,2
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Supply-pump
pressure bar: 3,5...4,1
2nd speed 1/min: 1050
Supply-pump
pressure bar: 6,0...6,6

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...138
quantity cm³/10s: (40...153)
2nd speed 1/min: 1090
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1270
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1200
Del.quantity cm3/: -
1000H.: (10,5...19,5)
4th speed 1/min: 1150
Del.quantity cm3/: 47,0...53,0
1000H.: (45,5...54,5)
5th speed 1/min: 1050
Del.quantity cm3/: 78,5...81,5
1000H.: (77,4...82,6)
6th speed 1/min: 800
Del.quantity cm3/: -
1000H.: (79,4...84,6)
7th speed 1/min: 650
Del.quantity cm3/: 75,0...79,0
1000H.: (73,6...80,4)
8th speed 1/min: 500
Del.quantity cm3/: 65,5...69,5
1000H.: (64,1...70,9)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1090
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: -
1000H.: (19,0...28,0)
2nd speed 1/min: 400
Del.quantity cm3/: 4,5...10,5
1000H.: (3,0...12,0)
3rd speed 1/min: 460
Del.quantity cm3/: -
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 220
Del.quantity cm3/: -
ind. 1000H: 100,0

2nd speed 1/min: 300
Del.quantity cm3/: -
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : -
Rated voltage : -

Mounting and assembly dimensions:

B04

Designation

K mm : -
KF mm : 5,1...5,4
MS mm : 1,0...1,25
SVS max. mm : 3,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,4 B
Edition : 3.12.86
replaces : 4.84
Calibrating oil : ISO 4113

Injection pump : VE 5/11F1900 L179
Type number : 0 460 415 007

Customer-specific information
Customer : MOTORI VM

Engine : HR 592 HTJ/9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value bar: 4,7...5,3

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 66,5...67,5
Dispersion cm³/
1000H.: 3,5

Full-load del. w/out charge press.:

Speed 1/min: 600
Del. quantity cm³/
1000H.: 41,5...42,5

Low-idle speed regulation:

Speed 1/min: 420
Charge press. hPa: -
Del. quantity cm³/
1000H.: 20,5...24,5
Dispersion cm³/
1000H.: -

Full-load speed regulation:

Speed 1/min: 2060
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 36,0...42,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 50,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: -
mm: (4,4...5,8)
3rd speed 1/min: 1900
Charge press. hPa: 1000
TD travel mm: 7,1...7,9
mm: (6,8...8,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
Supply-pump pressure bar: 1,7...2,3

2nd speed 1/min: 1900
Charge press. hPa: 1000
Supply-pump pressure bar: 6,0...6,6

Overflow quantity at overflow valve:

1st speed 1/min: 600
Charge press. hPa: -
Overflow quantity cm³/10s: 55...138
(40...153)
2nd speed 1/min: 1900
Charge press. hPa: 1000
Overflow quantity cm³/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 300
LDA stroke mm: 4,5
Del. quantity cm³/
1000H.: 51,0...52,0
(48,1...54,9)
2nd speed 1/min: 2200
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 0...3,0
3rd speed 1/min: 2160
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 2,0...8,0
(0,5...9,5)
4th speed 1/min: 2060
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (34,5...43,5)
5th speed 1/min: 1900
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 59,0...62,0
(57,8...63,2)
6th speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (64,3...69,7)
7th speed 1/min: 600
Charge press. hPa: -
Del. quantity cm³/
1000H.: (38,6...45,4)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm³/
1000H.: -

Electr. shutoff:

Speed 1/min: 1900
ELAB volt: 12,0
Del. quantity cm³/
1000H.: -

Idle delivery:

1st speed 1/min: 420
Del. quantity cm³/: -
1000H.: (18,0..27,0)
2nd speed 1/min: 500
Del. quantity cm³/: 14,0..20,0
1000H.: (12,5..21,5)
3rd speed 1/min: 650
Del. quantity cm³/: -
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 280
Del. quantity cm³/: -
ind. 1000H: 50,0
2nd speed 1/min: 380
Del. quantity cm³/: -
ax. 1000H: 55,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,9...6,1
MS mm : 0,9...1,1
SVS max. mm : 3,2

Remarks:
Pushing electromagnet.

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,5 0
Edition : 16.12.86
replaces : 6.84
Calibrating oil : ISO 4113

Injection pump : VE 6/11F1250 R181
Type number : 0 460 416 036

Customer-specific information
Customer : FIAT

Engine : 8065.06.200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1000
Setting value bar: 5,2...5,8

Full-load del. w/out charge press.:

Speed 1/min : 800

Del. quantity cm³/
1000H.: 63,5...64,5
Dispersion cm³/: 3,5
1000H.: (4,0)

Low-idle speed regulation:

Speed 1/min: 325
Del. quantity cm³/
1000H.: 8,0...12,0
Dispersion cm³/: 3,5
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1350
Del. quantity cm³/
1000H.: 33,0...39,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 95,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
TD travel mm: 0,7...1,5
mm: (0,4...1,8)
2nd speed 1/min: 1000
TD travel mm: -
mm: (4,4...5,8)
3rd speed 1/min: 1250
TD travel mm: 5,4...6,2
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,1...3,7
2nd speed 1/min: 1250
Supply-pump
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...138
quantity cm³/10s: (40...153)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:
1st speed 1/min: 1450

Del. quantity cm³/: -
1000H.: 0...2,0
3rd speed 1/min: 1400
Del. quantity cm³/: 2,0...9,0
1000H.: (1,0...10,0)
4th speed 1/min: 1350
Del. quantity cm³/: -
1000H.: (31,5...40,5)
5th speed 1/min: 1250
Del. quantity cm³/: 53,0...56,0
1000H.: (51,9...57,1)
6th speed 1/min: 800
Del. quantity cm³/: -
1000H.: (61,4...66,6)
7th speed 1/min: 500
Del. quantity cm³/: 58,5...61,5
1000H.: (56,6...63,4)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del. quantity cm³/: -
1000H.:

Idle delivery:

1st speed 1/min: 325
Del. quantity cm³/: -
1000H.: (5,5...14,5)
2nd speed 1/min: 360
Del. quantity cm³/: 2,0...8,0
1000H.: (0,5...9,5)
3rd speed 1/min: 400
Del. quantity cm³/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 150
Del. quantity cm³/: -
ind. 1000H: 95,0
2nd speed 1/min: 250
Del. quantity cm³/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4
KF mm : 5,2...5,4
MS mm : 1,5...1,7
SVS max. mm : 4,3

XK mm : 25,0...27,0
XL mm : 13,4...16,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 4,1 C
Edition : 02.04.87
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/11F1900 L218
Type number : O 460 416 047

Customer-specific information
Customer : VOLVO PENTA

Engine : TAMD 41

Power k: 147

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 3,6...4,0

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value bar: 6,6...7,2

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 102,0...103,0
Dispersion cm3/ : 3,5
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 650
Del. quantity cm3/
1000H.: 65,5...66,5

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm3/
1000H.: 18,0...22,0
Dispersion cm3/ : 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 2000
Charge press. hPa: 1000
Del. quantity cm3/
1000H: 67,0...73,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 80.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 1,0...2,0
mm: (0,8...2,2)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: -
mm: (3,1...4,5)
3rd speed 1/min: 1700
Charge press. hPa: 1000
TD travel mm: 4,5...5,3
mm: (4,2...5,6)
4th speed 1/min: 1900
Charge press. hPa: 1000
TD travel mm: 4,5...5,3
mm: (4,2...5,6)

Supply-pump pressure characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump
pressure bar: 5,5...6,1
2nd speed 1/min: 1900
Charge press. hPa: 1000
Supply-pump
pressure bar: 7,4...8,0

Overflow quantity at overflow valve:

1st speed 1/min: 650
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1900
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
Charge-air pressure-setting
point hPa: 200
Del. quantity cm3/: 86,5...87,5
1000H.: (84,3...89,7)
2nd speed 1/min: 2200
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...2,5
3rd speed 1/min: 2100
Charge press. hPa: 1000
Del. quantity cm3/: 5,0...15,0
1000H.: (4,0...16,0)
4th speed 1/min: 2000
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (65,5...74,5)
5th speed 1/min: 1900
Charge press. hPa: 1000
Del. quantity cm3/: 91,0...94,0
1000H.: (88,0...97,0)
6th speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (99,8...105,2)
7th speed 1/min: 800
Charge press. hPa: 1000
Del. quantity cm3/: 91,0...94,0
1000H.: (89,8...95,2)
8th speed 1/min: 800
Charge press. hPa: -
Del. quantity cm3/: 68,8...71,2
1000H.: (66,7...73,4)
9th speed 1/min: 650
Charge press. hPa: -
Del. quantity cm3/: -
1000H.: (62,6...69,4)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm³/: -
1000H.

Electr. shutoff:

Speed 1/min: 1900
ELAB volt: 12,0
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del. quantity cm³/: -
1000H.: (15,5...24,5)
2nd speed 1/min: 400
Del. quantity cm³/: 5,0...11,0
1000H.: (3,5...12,5)
3rd speed 1/min: 480
Del. quantity cm³/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300
Del. quantity cm³/: -
ind. 1000H: 80,0
2nd speed 1/min: 500
Del. quantity cm³/: -
ax. 1000H: 75,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-0T
MS	mm	:	0,7...0,95
SVS max.	mm	:	4,0
XK	mm	:	18,8...20,8
XL	mm	:	13,7...17,1

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 4,1 D
Edition : 02.04.87
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/11F1900 L218-1
Type number : 0 460 416 048

Customer-specific information
Customer : VOLVO PENTA

Engine : TAMD 41

Power k: 147

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 3,6...4,0

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value bar: 6,6...7,2

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 102,0...103,0
Dispersion cm³/
1000H.: 3,5

Full-load del. w/out charge press.:

Speed 1/min : 650
Del. quantity cm³/
1000H.: 65,5...66,5

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm³/
1000H.: 18,0...22,0
Dispersion cm³/
1000H.: -

Full-load speed regulation:

Speed 1/min: 2000
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 67,0...73,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 80,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 1,0...2,0
mm: (0,8...2,2)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: -
mm: (3,1...4,5)
3rd speed 1/min: 1700
Charge press. hPa: 1000
TD travel mm: 4,5...5,3
mm: (4,2...5,6)
4th speed 1/min: 1900
Charge press. hPa: 1000
TD travel mm: 4,5...5,3
mm: (4,2...5,5)

Supply-pump pressure characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump pressure bar: 5,5...6,1
2nd speed 1/min: 1900
Charge press. hPa: 1000
Supply-pump pressure bar: 7,4...8,0

Overflow quantity at overflow valve:

1st speed 1/min: 650
Charge press. hPa: -
Overflow quantity cm³/10s: 41...83
(26...98)
2nd speed 1/min: 1900
Charge press. hPa: 1000
Overflow quantity cm³/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
Charge-air pressure-setting point hPa: 200
Del. quantity cm³/
1000H.: 86,5...87,5
(84,3...89,7)
2nd speed 1/min: 2200
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 0...2,5
3rd speed 1/min: 2100
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 5,0...15,0
(4,0...16,0)
4th speed 1/min: 2000
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (65,5...74,5)
5th speed 1/min: 1900
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 91,0...94,0
(88,0...97,0)
6th speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: (99,8...105,2)
7th speed 1/min: 800
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 91,0...94,0
(89,8...95,2)
8th speed 1/min: 800
Charge press. hPa: -
Del. quantity cm³/
1000H.: 68,8...71,2
(66,6...73,4)
9th speed 1/min: 650
Charge press. hPa: -
Del. quantity cm³/
1000H.: (62,6...69,4)

Zero delivery (stop):
1000H.

Idle delivery:

1st speed 1/min: 350
Del. quantity cm³/: -
1000H.: (15,5...24,5)
2nd speed 1/min: 400
Del. quantity cm³/: 5,0...11,0
1000H.: (3,5...12,5)
3rd speed 1/min: 480
Del. quantity cm³/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300
Del. quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 500
Del. quantity cm³/: -
ax. 1000H: 75,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : K-0T
MS mm : 0,7...0,95
SVS max. mm : 4,0
XK mm : 18,8...20,8
XL mm : 13,7...17,1

Remarks:
Pushing electromagnet.

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 4,1 E
Edition : 8.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/11F1625 L218-4
Type number : 0 460 416 054

Customer-specific information
Customer : VOLVO PENTA

Engine : TAMD 41

Power k: 125

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC) : +0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value mm: 3,9...4,3

Supply-pump pressure:

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value bar: 6,1...6,7

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 87,0...88,0
Dispersion cm³/
1000H.: 5,0

Full-load del. w/out charge press.:

Speed 1/min: 650
Del. quantity cm³/
1000H.: 59,0...60,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm³/
1000H.: 15,5...19,5
Dispersion cm³/
1000H.: 3,5

Full-load speed regulation:

Speed 1/min: 1800
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 37,0...43,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 85,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
Charge press. hPa: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 1200
Charge press. hPa: 1000
TD travel mm: -
mm: (3,4...4,8)
3rd speed 1/min: 1400
Charge press. hPa: 1000
TD travel mm: 4,5...5,3
mm: (4,2...5,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000

Supply-pump
pressure bar: 4,7...5,3
2nd speed 1/min: 1625
Charge press. hPa: 1000
Supply-pump
pressure bar: 7,3...7,9

Overflow quantity at overflow valve:

1st speed 1/min: 700
Charge press. hPa: 1000
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1625
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
Charge-air pressure-setting
point hPa: 260
Del.quantity cm3/: 66,0...67,0
1000H.: (63,8...69,2)
2nd speed 1/min: 1970
Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 1900
Charge press. hPa: 1000
Del.quantity cm3/: 2,5...10,5
1000H.: (2,0...11,0)
4th speed 1/min: 1800
Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: (35,5...44,5)
5th speed 1/min: 1625
Charge press. hPa: 1000
Del.quantity cm3/: 80,0...83,0
1000H.: (78,8...84,2)
6th speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: (84,8...90,2)
7th speed 1/min: 1000
Charge press. hPa: 1000
Del.quantity cm3/: 93,8...96,2
1000H.: (92,3...97,7)
8th speed 1/min: 800
Charge press. hPa: 1000
Del.quantity cm3/: 91,5...94,5
1000H.: (89,6...96,4)
9th speed 1/min: 650
Charge press. hPa: -
Del.quantity cm3/: -
1000H.: (56,8...62,2)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.
Electr. shutoff:
Speed 1/min: 1625
ELAB volt: 12,0
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: -
1000H.: (13,0...22,0)
2nd speed 1/min: 400
Del.quantity cm3/: 3,0...9,0
1000H.: (1,5...10,5)
3rd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm3/: -
ind. 1000H: 85,0
2nd speed 1/min: 500
Del.quantity cm3/: -
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-0T
MS	mm	:	1,2...1,45
SVS max.	mm	:	-
XK	mm	:	18,8...20,8
XL	mm	:	12,2...15,6

Remarks:

Pushing electromagnet.

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL4,1 F
Edition : 8.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/11F1625 L218-5
Type number : 0 460 416 055

Customer-specific information
Customer : VOLVO PENTA

Engine : TAMD 41

Power k: 125

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC) : +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value mm: 3,9...4,3

Supply-pump pressure:

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value bar: 6,1...6,7

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 87,0...88,0
Dispersion cm3/ : 5,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 650
Del.quantity cm3/
1000H.: 59,0...60,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm3/
1000H.: 15,5...19,5
Dispersion cm3/ : 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1800
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 37,0...43,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 85,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
Charge press. hPa: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 1200
Charge press. hPa: 1000
TD travel mm: -
mm: (3,4...4,8)
3rd speed 1/min: 1400
Charge press. hPa: 1000
TD travel mm: 4,5...5,3
mm: (4,2...5,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000

Supply-pump
pressure bar: 4,7...5,3
2nd speed 1/min: 1625
Charge press. hPa: 1000
Supply-pump
pressure bar: 7,3...7,9

Overflow quantity at overflow valve:

1st speed 1/min: 700
Charge press. hPa: 1000
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1625
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
Charge-air pressure-setting
point hPa: 260
Del.quantity cm³/: 66,0...67,0
1000H.: (63,8...69,2)

2nd speed 1/min: 1970
Charge press. hPa: 1000
Del.quantity cm³/: -
1000H.: 0...3,0

3rd speed 1/min: 1900
Charge press. hPa: 1000
Del.quantity cm³/: 2,5...10,5
1000H.: (2,0...11,0)

4th speed 1/min: 1800
Charge press. hPa: 1000
Del.quantity cm³/: -
1000H.: (35,5...44,5)

5th speed 1/min: 1625
Charge press. hPa: 1000
Del.quantity cm³/: 80,0...83,0
1000H.: (78,8...84,2)

6th speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³/: -
1000H.: (84,8...90,2)

7th speed 1/min: 1000
Charge press. hPa: 1000
Del.quantity cm³/: 93,8...96,2
1000H.: (92,3...97,7)

8th speed 1/min: 800
Charge press. hPa: 1000
Del.quantity cm³/: 91,5...94,5
1000H.: (89,6...96,4)

9th speed 1/min: 650
Charge press. hPa: -
Del.quantity cm³/: -
1000H.: (56,8...62,2)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm³/: -
1000H.

Electr. shutoff:
Speed 1/min: 1625
Del.quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm³/: -
1000H.: (13,0...22,0)

2nd speed 1/min: 400
Del.quantity cm³/: 3,0...9,0
1000H.: (1,5...10,5)

3rd speed 1/min: 450
Del.quantity cm³/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm³/: -
ind. 1000H: 85,0

2nd speed 1/min: 500
Del.quantity cm³/: -
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : K-0T
MS mm : 1,2...1,45
SVS max. mm : 3,6
XK mm : 18,8...20,8
XL mm : 12,2...15,6

Remarks:
Pushing electromagnet.

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 A5
Edition : 22.10.86
replaces : 4.85
Calibrating oil : ISO-4113

Injection pump : VE 4/12F1100 R123-5
Type number : 0 460 424 011

Customer-specific information
Customer : CUMMINS

Engine : 4 BT-390

Power k: 60
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 016

Opening
pressure bar : 207...210

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 70,5...71,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
Full-load speed regulation:

Speed 1/min: 1120
Del.quantity cm3/
1000H: 52,0...58,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 97,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
TD travel mm: 0,4...1,2
mm: (0,1...1,5)
2nd speed 1/min: 900
TD travel mm: -
mm: (1,8...3,2)
3rd speed 1/min: 1100
TD travel mm: 3,3...4,1
mm: (3,0...4,4)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Supply-pump
pressure bar: 2,1...2,7
2nd speed 1/min: 750
Supply-pump
pressure bar: 3,7...4,3
3rd speed 1/min: 1100
Supply-pump
pressure bar: 5,2...5,8

Overflow quantity at overflow valve:

1st speed 1/min: 400

Overflow : 41...83
quantity cm3/10s: (26....98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1230
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1200
Del.quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1160
Del.quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1120
Del.quantity cm3/: -
1000H.: (50,0...60,0)
6th speed 1/min: 1100
Del.quantity cm3/: 64,5...67,5
1000H.: (63,0...69,0)
7th speed 1/min: 900
Del.quantity cm3/: -
1000H.: (68,0...74,0)
8th speed 1/min: 750
Del.quantity cm3/: 70,5...74,5
1000H.: (68,8...76,2)
9th speed 1/min: 400
Del.quantity cm3/: 63,5...67,5
1000H.: (61,8...69,2)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 1100
ELAB volt: -
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: 17,0...23,0
1000H.: (15,0...25,0)
2nd speed 1/min: 375
Del.quantity cm3/: -
1000H.: (6,0...16,0)
3rd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm3/: -
ind. 1000H: 97,0

2nd speed 1/min: 200
Del.quantity cm3/: -
ax. 1000H: 85,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,4...1,6
SVS max.	mm	:	3,4
XK	mm	:	20,2...22,2
XL	mm	:	12,5...15,9

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 A6
Edition : 1.10.86
replaces : 1.85
Calibrating oil : ISO-4113

Injection pump : VE 4/12F1050 R123-6
Type number : 0 460 424 012

Customer-specific information
Customer : CUMMINS

Engine : 4 BT-390 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 016

Opening
pressure bar : 207...210

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC) : $\pm 0,02(0,04)$

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,5...5,1

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 64,5...65,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 420
Del.quantity cm3/
1000H.: 18,5...24,5
Dispersion cm3/: 3,5
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1110
Del.quantity cm3/
1000H.: 32,0...38,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 97,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1,1...1,9
mm: (0,8...2,2)
2nd speed 1/min: 900
TD travel mm: -
mm: (1,8...3,2)
3rd speed 1/min: 1050
TD travel mm: 3,2...4,0
mm: (2,9...4,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump pressure bar: 2,8...3,4
2nd speed 1/min: 750
Supply-pump pressure bar: 3,8...4,4
3rd speed 1/min: 1050
Supply-pump pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...138
quantity cm3/10s: (40...153)

2nd speed 1/min: 1050
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1160
Del.quantity cm3/: -
1000H.: 0...1,5
2nd speed 1/min: 1110
Del.quantity cm3/: -
1000H.: (30,0...40,0)
3rd speed 1/min: 1050
Del.quantity cm3/: 59,5...62,5
1000H.: (58,0...64,0)
4th speed 1/min: 900
Del.quantity cm3/: -
1000H.: (62,0...68,0)
5th speed 1/min: 750
Del.quantity cm3/: 64,0...68,0
1000H.: (63,3...68,7)
6th speed 1/min: 500
Del.quantity cm3/: 60,0...64,0
1000H.: (59,3...64,7)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del.quantity cm3/: -
1000H.:

Electr. shutoff:
Speed 1/min: 375
Del.quantity cm3/: -
1000H.:

Idle delivery:

1st speed 1/min: 420
Del.quantity cm3/: -
1000H.: (16,5...26,5)
2nd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H.: 97,0
2nd speed 1/min: 200
Del.quantity cm3/: -
ax. 1000H.: 85,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2-5,5
MS	mm	:	1,4-1,65
SVS max.	mm	:	4,2
XK	mm	:	20,2-22,2
XL	mm	:	11,7-15,0

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 E
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R226
Type number : 0 460 424 022

Customer-specific information
Customer : CUMMINS

Engine : 4BT-3.9

Power k: 70
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,1...4,7
Full-load del. w/out charge press.:

Speed 1/min: 900
Del.quantity cm3/
1000H.: 65,5...66,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm3/
1000H.: 53,0...59,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1,3...2,1
mm: (1,0...2,4)
2nd speed 1/min: 900
TD travel mm: -
mm: (1,8...3,2)
3rd speed 1/min: 1100
TD travel mm: 3,1...3,9
mm: (2,8...4,2)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Supply-pump pressure bar: 0,8...1,4
2nd speed 1/min: 500
Supply-pump pressure bar: 2,3...2,9
3rd speed 1/min: 1100
Supply-pump pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1220
Del.quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1180
Del.quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1150
Del.quantity cm3/: -
1000H.: (51,0...61,0)
6th speed 1/min: 1100
Del.quantity cm3/: 63,5...66,5
1000H.: (62,0...68,0)
7th speed 1/min: 900
Del.quantity cm3/: -
1000H.: (63,0...69,0)
8th speed 1/min: 750
Del.quantity cm3/: 68,0...72,0
1000H.: (66,3...73,7)
9th speed 1/min: 500
Del.quantity cm3/: 67,0...75,0
1000H.: (67,3...74,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 300
Del.quantity cm3/: 35,0...47,0
1000H.: (36,0...46,0)
2nd speed 1/min: 375
Del.quantity cm3/: -
1000H.: (6,0...16,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130

Del. quantity cm3/: -
ind. 1000H: 80,0

2nd speed 1/min: 240
Del. quantity cm3/: -
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,2...1,45
SVS max.	mm	:	4,2
XK	mm	:	20,2...22,2
XL	mm	:	11,0...14,4

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 E1
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1150 R226-1
Type number : 0 460 424 023

Customer-specific information
Customer : CUMMINS

Engine : 4BT-3.9

Power k: 53
Speed 1/mi: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,2...4,8
Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 67,0...68,0
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1190
Del.quantity cm3/
1000H.: 47,0...53,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 70,0

Inspection-pump test specifications.
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 900
TD travel mm: -
mm: (1,5...2,9)
3rd speed 1/min: 1150
TD travel mm: 3,2...4,0
mm: (2,9...4,3)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Supply-pump pressure bar: 0,9...1,5
2nd speed 1/min: 500
Supply-pump pressure bar: 2,5...3,1
3rd speed 1/min: 1150
Supply-pump pressure bar: 5,2...5,8

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1150
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1240
Del.quantity cm3/: 13,0...25,0
1000H.: (14,0...24,0)
4th speed 1/min: 1190
Del.quantity cm3/: -
1000H.: (45,0...55,0)
5th speed 1/min: 1150
Del.quantity cm3/: 63,5...66,5
1000H.: (62,0...68,0)
6th speed 1/min: 900
Del.quantity cm3/: -
1000H.: (64,5...70,5)
7th speed 1/min: 750
Del.quantity cm3/: 69,5...73,5
1000H.: (67,8...75,2)
8th speed 1/min: 500
Del.quantity cm3/: 68,0...76,0
1000H.: (68,3...75,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 300
Del.quantity cm3/: 32,0...44,0
1000H.: (33,0...43,0)
2nd speed 1/min: 375
Del.quantity cm3/: -
1000H.: (6,0...16,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 80,0

2nd speed 1/min: 240
Del. quantity cm³/: -
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,2...1,45
SVS max.	mm	:	4,2
XK	mm	:	18,8...20,8
XL	mm	:	11,7...15,1

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 E2
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1250 R226-2
Type number : 0 460 424 024

Customer-specific information
Customer : CUMMINS

Engine : 4BT 3.9

Power k: 55
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 42...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,6...5,2
Full-load del. w/out charge press.:

Speed 1/min: 1100
Del.quantity cm3/
1000H.: 65,5...66,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 335
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1290
Del.quantity cm3/
1000H.: 42,0...48,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 900
TD travel mm: -
mm: (1,5...2,9)
3rd speed 1/min: 1100
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Supply-pump pressure bar: 1,3...1,9
2nd speed 1/min: 750
Supply-pump pressure bar: 3,9...4,5
3rd speed 1/min: 1100
Supply-pump pressure bar: 2,9...3,7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1370
Del.quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1330
Del.quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1290
Del.quantity cm3/: -
1000H.: (40,0...50,0)
6th speed 1/min: 1250
Del.quantity cm3/: 63,0...66,0
1000H.: (61,5...67,5)
7th speed 1/min: 1100
Del.quantity cm3/: -
1000H.: (63,0...69,0)
8th speed 1/min: 750
Del.quantity cm3/: 69,0...73,0
1000H.: (67,3...74,7)
9th speed 1/min: 500
Del.quantity cm3/: 70,0...78,0
1000H.: (70,3...73,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 335
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 335
Del.quantity cm3/: -
1000H.: (6,0...16,0)
2nd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H.: 75,0

2nd speed 1/min: 300
Del. quantity cm3/: -
ax. 1000H: 75,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,2...1,45
SVS max.	mm	:	4,2
XK	mm	:	18,8...20,8
XL	mm	:	11,5...14,9

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D2
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R231
Type number : 0 460 424 028

Customer-specific information
Customer : CUMMINS

Engine : 4BTA-3.9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC) : +0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 850
Charge press. hPa: 1000

Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 85,5...86,5
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm3/
1000H.: 63,5...64,5

Low-idle speed regulation:

Speed 1/min: 365
Charge press. hPa: -
Del. quantity cm3/
1000H.: 8,0...14,0

Full-load speed regulation:

Speed 1/min: 1310
Charge press. hPa: 1000
Del. quantity cm3/
1000H: 61,0...67,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 1,8...2,6
mm: (1,5...2,9)
2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: -
mm: (3,5...4,9)
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 4,9...5,7
mm: (4,6...6,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000

Supply-pump
pressure bar: 4,0...4,6
2nd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump
pressure bar: 6,7...7,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 350
Del. quantity cm3/: 79,5...80,5
1000H.: (77,0...83,0)
2nd speed 1/min: 1420
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1400
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1360
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1310
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (59,0...69,0)
6th speed 1/min: 1250
Charge press. hPa: 1000
Del. quantity cm3/: 75,5...78,5
1000H.: (74,0...80,0)
7th speed 1/min: 1100
Charge press. hPa: 1000
Del. quantity cm3/: 77,5...78,5
1000H.: (76,0...80,5)
8th speed 1/min: 850
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (83,0...89,0)
9th speed 1/min: 500
Charge press. hPa: 1000
Del. quantity cm3/: 91,0...99,0
1000H.: -
10th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm3/: -
1000H.: (61,0...67,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 365
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 365
Del.quantity cm3/: -
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 60,0

2nd speed 1/min: 230
Del.quantity cm3/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,1...1,35
SVS max.	mm	:	2,6
XK	mm	:	20,2...22,2
XL	mm	:	13,1...16,6

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D3
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1250 R239-1
Type number : O 460 424 031

Customer-specific information
Customer : CUMMINS

Engine : 4BT-3.9 AUTO

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 0,8...1,2

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,7...6,3

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 82,0...83,0
Dispersion cm³/ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm³/
1000H.: 54,0...55,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del. quantity cm³/
1000H.: 13,5...19,5
Dispersion cm³/ : 5,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1400
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 59,5...65,5

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 0,3...1,1
mm: (0...1,4)
2nd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: -
mm: (0,3...1,7)
3rd speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 1,5...2,3
mm: (1,2...2,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2,9...3,5
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump pressure bar: 4,6...5,2
3rd speed 1/min: 1250
Charge press. hPa: 1000
Supply-pump pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 600
Del. quantity cm³/ : 72,0...73,0
1000H.: (69,5...75,5)
2nd speed 1/min: 1520
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: 0...2,0
3rd speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: 0...15,0
4th speed 1/min: 1460
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: 0...15,0
5th speed 1/min: 1400
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: (57,5...67,5)
6th speed 1/min: 1250
Charge press. hPa: 1000
Del. quantity cm³/ : 75,0...78,0
1000H.: (73,5...79,5)
7th speed 1/min: 1100
Charge press. hPa: 1000
Del. quantity cm³/ : 77,0...80,0
1000H.: (75,5...81,5)
8th speed 1/min: 850
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: (79,5...85,5)

9th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm3/: 101,0...109,0
1000H: (101,3...108,7)
10th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm3/: -
1000H: (51,5...57,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: -
1000H.: (11,5...21,5)
2nd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 340
Del.quantity cm3/: -
ind. 1000H: 75,0
2nd speed 1/min: 440
Del.quantity cm3/: -
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-0T
MS	mm	:	1,1...1,35
SVS max.	mm	:	3,8
XK	mm	:	20,2...22,2
XL	mm	:	12,4...15,8

Remarks:

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D1
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1050 R230-3
Type number : 0 460 424 033

Customer-specific information
Customer : CUMMINS

Engine : 4BTA-3.9

Power k: 79
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 5,0...5,6

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 89,5...90,5
Dispersion cm3/ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm3/
1000H.: 63,5...64,5

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del. quantity cm3/
1000H.: 8,0...14,0

Full-load speed regulation:

Speed 1/min: 1100
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 59,0...65,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 1,7...2,5
mm: (1,4...2,8)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: -
mm: (2,9...4,3)
3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 4,7...5,5
mm: (4,4...5,8)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 3,9...4,5
2nd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1050
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 350
Del. quantity cm3/: 79,5...80,5
1000H.: (77,0...83,0)
2nd speed 1/min: 1180
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1160
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1120
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1100
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (57,0...67,0)
6th speed 1/min: 1050
Charge press. hPa: 1000
Del. quantity cm3/: 76,5...79,5
1000H.: (75,0...81,0)
7th speed 1/min: 900
Charge press. hPa: 1000
Del. quantity cm3/: 82,0...85,0
1000H.: (80,5...86,5)
8th speed 1/min: 750
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (87,0...93,0)
9th speed 1/min: 500
Charge press. hPa: 1000
Del. quantity cm3/: 91,0...99,0
1000H.: -
10th speed 1/min: 500
Charge press. hPa: -

Del. quantity cm³/: -
1000H: (61,0...67,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm³/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del. quantity cm³/: -
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del. quantity cm³/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del. quantity cm³/: -
ind. 1000H: 60,0

2nd speed 1/min: 230
Del. quantity cm³/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,1...1,35
SVS max.	mm	: 2,2
XK	mm	: 20,2...22,2
XL	mm	: 11,9...15,3

Remarks:

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 D1
Edition : 12.12.86
replaces : 4.85
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R159-4
Type number : 0 460 426 044

Customer-specific information
Customer : CUMMINS

Engine : 6BT-5.9

Power k: 76
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 016

Opening
pressure bar : 207...210

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,6...4,0

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 4,2...4,8

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 83,0...84,0
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 22,0...28,0
Full-load speed regulation:

Speed 1/min: 1125
Del.quantity cm3/
1000H.: 36,0...44,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 97,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,8...2,6
mm: (1,5...2,9)
2nd speed 1/min: 750
TD travel mm: -
mm: (3,1...4,5)
3rd speed 1/min: 900
TD travel mm: 4,6...5,4
mm: (4,3...5,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,0...3,6
2nd speed 1/min: 900
Supply-pump
pressure bar: 4,7...5,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1050

Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1175

Del.quantity cm3/: -

1000H.: 0...1,5

3rd speed 1/min: 1125

Del.quantity cm3/: 36,0...44,0

1000H.: (35,0...45,0)

4th speed 1/min: 1050

Del.quantity cm3/: 78,5...81,5

1000H.: (77,0...83,0)

5th speed 1/min: 900

Del.quantity cm3/: -

1000H.: (80,5...86,5)

6th speed 1/min: 750

Del.quantity cm3/: 83,5...87,5

1000H.: (81,8...89,2)

7th speed 1/min: 500

Del.quantity cm3/: 84,0...88,0

1000H.: (82,3...89,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -

Del.quantity cm3/: -

1000H.

Electr. shutoff:

Speed 1/min: 375

Del.quantity cm3/: -

1000H.

Idle delivery:

1st speed 1/min: 300

Del.quantity cm3/: 45,0...53,0

1000H.: (44,0...54,0)

2nd speed 1/min: 375

Del.quantity cm3/: -

1000H.: (20,0...30,0)

3rd speed 1/min: 450

Del.quantity cm3/: -

1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm3/: -

ind. 1000H: 97,0

2nd speed 1/min: 200

Del.quantity cm3/: -

ax. 1000H: 85,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : -

KF mm : 5,2...5,5

MS mm : 1,4...1,6

SVS max. mm : 0,8

XK mm : 20,2...22,2

XL mm : 10,7...14,1

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L
Edition : 10.12.86
replaces : 1.85
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R173-3
Type number : O 460 426 058

Customer-specific information
Customer : CUMMINS

Engine : 6BTA 5,9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 016

Opening
pressure bar : 207...210

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Charge press. hPa: 750
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900
Charge press. hPa: 750

Setting value bar: 4,1...4,7

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 750
Del. quantity cm3/
1000H.: 91,0...92,0
Dispersion cm3/ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm3/
1000H.: 66,0...67,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del. quantity cm3/
1000H.: 20,5...26,5
Dispersion cm3/: 3,5
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1100
Charge press. hPa: 750
Del. quantity cm3/
1000H.: 64,5...70,5

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 97,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 750
TD travel mm: 1,3...2,1
mm: (1,0...2,8)
2nd speed 1/min: 900
Charge press. hPa: 750
TD travel mm: -
mm: (1,5...2,9)
3rd speed 1/min: 1050
Charge press. hPa: 750
TD travel mm: 2,7...3,3
mm: (2,3...3,6)

Supply-pump pressure characteristic:

1st speed 1/min: 200

Charge press. hPa: 750

Supply-pump
pressure bar: 1,1...1,7
2nd speed 1/min: 750
Charge press. hPa: 750
Supply-pump
pressure bar: 3,6...4,2
3rd speed 1/min: 1050
Charge press. hPa: 750
Supply-pump
pressure bar: 4,8...4,7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 55...138
quantity cm3/10s: (40...153)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600
Charge-air pressure-setting
point hPa: 400
LDA stroke mm: 6,2
Del. quantity cm3/: 82,5...83,5
1000H.: (80,0...86,0)

2nd speed 1/min: 1170
Charge press. hPa: 750
Del. quantity cm3/: -
1000H.: 0...1,5

3rd speed 1/min: 1160
Charge press. hPa: 750
Del. quantity cm3/: -
1000H.: 0...15

4th speed 1/min: 1120
Charge press. hPa: 750
Del. quantity cm3/: -
1000H.: 0...15,0

5th speed 1/min: 1100
Charge press. hPa: 750
Del. quantity cm3/: -
1000H.: (62,5...72,5)

6th speed 1/min: 1050
Charge press. hPa: 750
Del. quantity cm3/: 78,5...81,5
1000H.: (77,0...83,0)

7th speed 1/min: 900
Charge press. hPa: 750
Del. quantity cm3/: 85,5...88,5
1000H.: (84,0...90,0)

8th speed 1/min: 750
Charge press. hPa: 750
Del. quantity cm3/: -
1000H.: (88,5...94,5)

9th speed 1/min: 500
Charge press. hPa: 750
Del. quantity cm3/: 102,0...106,0
1000H.: (100,3...107,7)

10th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm³/: -
1000H: (63,5...69,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del. quantity cm³/: -
1000H.

Electr. shutoff:
Speed 1/min: 375
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del. quantity cm³/: -
1000H.: (18,5...28,5)
2nd speed 1/min: 450
Del. quantity cm³/: -
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 130
Del. quantity cm³/: -
ind. 1000H: 85,0
2nd speed 1/min: 230
Del. quantity cm³/: -
ax. 1000H: 85,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,2...5,5
MS mm : 1,4...1,6
SVS max. mm : 1,2

Remarks:
Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L1
Edition : 10.12.86
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1250 R173-4
Type number : 0 460 426 060

Customer-specific information
Customer : CUMMINS

Engine : 6BTA-5,9

Power k: 132
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 800
Setting value mm: 1,4...1,8

Supply-pump pressure:

C20

Speed 1/min: 750
Charge press. hPa: 800
Setting value bar: 3,3...3,9

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 82,5...83,5
Dispersion cm³/
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm³/
1000H.: 37,0...38,0

Low-idle speed regulation:

Speed 1/min: 365
Charge press. hPa: -
Del. quantity cm³/
1000H.: 8,0...14,0
Dispersion cm³/
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1300
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 59,0...65,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 800
TD travel mm: 0,4...1,2
mm: (0,1...1,5)
2nd speed 1/min: 750
Charge press. hPa: 800
TD travel mm: -
mm: (0,9...2,3)
3rd speed 1/min: 1050
Charge press. hPa: 800
TD travel mm: 2,2...3,0
mm: (1,9...3,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 800
Supply-pump pressure bar: 2,2...2,8
2nd speed 1/min: 1050
Charge press. hPa: 800
Supply-pump pressure bar: 4,4...5,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow quantity cm³/10s: 41...83
2nd speed 1/min: 1250
Charge press. hPa: 800
Overflow quantity cm³/10s: 55...138
3rd speed 1/min: 1370
Charge press. hPa: 800
Overflow quantity cm³/10s: 40...153

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 400
Del. quantity cm³/1000H.: 69,5...70,5
2nd speed 1/min: 1400
Charge press. hPa: 800
Del. quantity cm³/1000H.: 0...3,0
3rd speed 1/min: 1370
Charge press. hPa: 800
Del. quantity cm³/1000H.: 0...15,0
4th speed 1/min: 1340
Charge press. hPa: 800
Del. quantity cm³/1000H.: 0...15,0
5th speed 1/min: 1300
Charge press. hPa: 800
Del. quantity cm³/1000H.: (57,0...67,0)
6th speed 1/min: 1250
Charge press. hPa: 800
Del. quantity cm³/1000H.: 76,0...79,0
7th speed 1/min: 1050
Charge press. hPa: 800
Del. quantity cm³/1000H.: 79,5...82,5
8th speed 1/min: 750
Charge press. hPa: 800
Del. quantity cm³/1000H.: (80,0...86,0)
9th speed 1/min: 500
Charge press. hPa: 800
Del. quantity cm³/1000H.: 83,5...91,5

10th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm³/1000H.: (34,5...40,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del. quantity cm³/1000H.: -

Electr. shutoff:

Speed 1/min: 375
Del. quantity cm³/1000H.: -

Idle delivery:

1st speed 1/min: 375
Del. quantity cm³/1000H.: (6,0...16,0)
2nd speed 1/min: 500
Del. quantity cm³/1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 200
Del. quantity cm³/ind.: 60,0
2nd speed 1/min: 350
Del. quantity cm³/ax.: 60,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,3...1,55
XK	mm	:	20,2...22,2
XL	mm	:	11,9...15,3

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P
Edition : 12.12.86
replaces : 9.85
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1400 R159-15
Type number : 0 460 426 064

Customer-specific information
Customer : CUMMINS

Engine : 6BT-5,9

Power k: 69
Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 850
Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

Speed 1/min: 1100
Del. quantity cm3/
1000H.: 56,5...57,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del. quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1470
Del. quantity cm3/
1000H.: 32,0...38,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 50,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 850
TD travel mm: -
mm: (3,3...4,7)
3rd speed 1/min: 1100
TD travel mm: 5,4...6,2
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump pressure bar: 2,5...3,1
2nd speed 1/min: 1100
Supply-pump pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)

2nd speed 1/min: 1400
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1580
Del. quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1520
Del. quantity cm3/: 8,5...12,5
1000H.: (7,5...13,5)
4th speed 1/min: 1470
Del. quantity cm3/: -
1000H.: (30,0...40,0)
5th speed 1/min: 1400
Del. quantity cm3/: 53,5...56,5
1000H.: (52,0...58,0)
6th speed 1/min: 1100
Del. quantity cm3/: -
1000H.: (54,0...60,0)
7th speed 1/min: 850
Del. quantity cm3/: 52,5...56,5
1000H.: (50,8...58,2)
8th speed 1/min: 500
Del. quantity cm3/: 39,0...47,0
1000H.: (39,3...46,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del. quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 300
Del. quantity cm3/: 41,0...49,0
1000H.: (40,0...50,0)
2nd speed 1/min: 375
Del. quantity cm3/: -
1000H.: (6,0...16,0)
3rd speed 1/min: 450
Del. quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del. quantity cm3/: -
ind. 1000H.: 60,0
2nd speed 1/min: 400
Del. quantity cm3/: -
ax. 1000H.: 60,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : -

KF mm : 5,1...5,4

MS mm : 1,4...1,6

SVS max. mm : 0,8

XK mm : 20,2...22,2

XL mm : 10,8...14,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P1
Edition : 16.10.86
replaces : -
Calibrating oil : ISO-4113

Injection pump : VE 6/12F1250 R159-16
Type number : 0 460 426 066

Customer-specific information
Customer : CUMMINS

Engine : 6 BT-59

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC) : +/-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 68,5...69,5
Dispersion cm3/: 4,0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm3/
1000H.: 20,5...29,5
Dispersion cm3/: 5,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1300
Del.quantity cm3/
1000H.: 52,0...58,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 60,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
2nd speed 1/min: 750
TD travel mm: -
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump pressure bar: 2,4...3,0
2nd speed 1/min: 1100
Supply-pump pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 1390
Del.quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1350
Del.quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1300
Del.quantity cm3/: -
1000H.: (50,0...60,0)
6th speed 1/min: 1250
Del.quantity cm3/: 65,7...68,7
1000H.: (64,2...70,2)
7th speed 1/min: 1100
Del.quantity cm3/: -
1000H.: (66,0...72,0)
8th speed 1/min: 750
Del.quantity cm3/: 68,5...72,5
1000H.: (67,5...73,5)
9th speed 1/min: 500
Del.quantity cm3/: 51,0...58,0
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: -
1000H.: (20,0...30,0)
2nd speed 1/min: 375
Del.quantity cm3/: 8,0...14,0
1000H.: (6,0...16,0)
3rd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 60,0
2nd speed 1/min: 240
Del.quantity cm3/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : -

KF mm : 5,1...5,4

MS mm : 0,9...1,15

SVS max. mm : 1,2

XK mm : 18,8...20,8

XL mm : 11,8...15,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S
Edition : 11.12.86
replaces : 10.85
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R225-4
Type number : O 460 426 071

Customer-specific information
Customer : CUMMINS

Engine : 6BT-5,9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 71,5...72,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1190
Del.quantity cm3/
1000H.: 50,0...56,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 750
TD travel mm: -
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Supply-pump pressure bar: 0,9...1,5
2nd speed 1/min: 500
Supply-pump pressure bar: 2,4...3,0
3rd speed 1/min: 1100
Supply-pump pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)

2nd speed 1/min: 1150
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1260
Del.quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1220
Del.quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1190
Del.quantity cm3/: -
1000H.: (48,0...58,0)
6th speed 1/min: 1150
Del.quantity cm3/: 66,5...69,5
1000H.: (65,0...71,0)
7th speed 1/min: 900
Del.quantity cm3/: -
1000H.: (69,0...75,0)
8th speed 1/min: 750
Del.quantity cm3/: 71,0...75,0
1000H.: (69,3...76,7)
9th speed 1/min: 500
Del.quantity cm3/: 58,0...66,0
1000H.: (58,3...65,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: -
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 70,0
2nd speed 1/min: 240
Del.quantity cm3/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,2...5,4
MS mm : 0,9...1,1
SVS max. mm : 1,0
XK mm : 20,2...22,2
XL mm : 11,5...14,9

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S2
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1200 R225-6
Type number : 0 460 426 073

Customer-specific information
Customer : CUMMINS

Engine : 6BT-5,9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC) : +0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 58,0...59,0
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0

Full-load speed regulation:

Speed 1/min: 1240
Del.quantity cm3/
1000H.: 42,5...48,5

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 50,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 750
TD travel mm: -
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump pressure bar: 2,4...3,0
2nd speed 1/min: 1100
Supply-pump pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1200
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

D04

1st speed 1/min: 1300
Del.quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 1270
Del.quantity cm3/: 17,5...29,5
1000H.: (18,5...28,5)
4th speed 1/min: 1240
Del.quantity cm3/: -
1000H.: (40,5...50,5)
5th speed 1/min: 1200
Del.quantity cm3/: 56,0...59,0
1000H.: (54,5...60,5)
6th speed 1/min: 1100
Del.quantity cm3/: -
1000H.: (55,5...61,5)
7th speed 1/min: 750
Del.quantity cm3/: 56,0...60,0
1000H.: (54,3...61,7)
8th speed 1/min: 500
Del.quantity cm3/: 48,5...56,5
1000H.: (48,8...56,2)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: 23,0...31,0
1000H.: (22,0...32,0)
2nd speed 1/min: 375
Del.quantity cm3/: -
1000H.: (6,0...16,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 60,0
2nd speed 1/min: 400
Del.quantity cm3/: -
ax. 1000H: 50,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,3...1,55
SVS max.	mm	:	1,6
XK	mm	:	20,2...22,2
XL	mm	:	11,1...14,5

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S3
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R225-10
Type number : 0 460 426 076

Customer-specific information
Customer : CUMMINS

Engine : 6BT-5,9

Power k: 89
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,3...3,7

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 59,5...60,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0

Full-load speed regulation:

Speed 1/min: 1100
Del.quantity cm3/
1000H.: 42,0...48,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,4...2,2
mm: (1,1...2,5)
2nd speed 1/min: 750
TD travel mm: -
mm: (2,8...4,2)
3rd speed 1/min: 1050
TD travel mm: 5,5...6,3
mm: (5,2...6,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump pressure bar: 2,9...3,5
2nd speed 1/min: 1050
Supply-pump pressure bar: 5,3...5,9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow quantity cm3/10s: 41...83
(26...98)
2nd speed 1/min: 1050

Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1160
Del.quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1130
Del.quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1100
Del.quantity cm3/: 42,0...48,0
1000H.: (40,0...50,0)
6th speed 1/min: 1050
Del.quantity cm3/: 57,2...60,2
1000H.: (55,7...61,7)
7th speed 1/min: 900
Del.quantity cm3/: 58,6...61,6
1000H.: (57,1...63,1)
8th speed 1/min: 750
Del.quantity cm3/: -
1000H.: (57,0...63,0)
9th speed 1/min: 500
Del.quantity cm3/: 53,0...61,0
1000H.: (53,3...60,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: 17,0...26,0
1000H.: (16,5...26,5)
2nd speed 1/min: 375
Del.quantity cm3/: -
1000H.: (6,0...16,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 70,0
2nd speed 1/min: 300

Del. quantity cm3/: -
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,3...1,55
SVS max.	mm	:	1,6
XK	mm	:	18,8...20,8
XL	mm	:	12,1...15,5

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S4
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1000 R225-11
Type number : 0 460 426 080

Customer-specific information
Customer : CUMMINS

Engine : 6BT-5,9

Power k: 65
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,3...3,7

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1
Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 47,5...48,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1050
Del.quantity cm3/
1000H.: 30,0...36,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 40,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,1...1,9
mm: (0,8...2,2)
2nd speed 1/min: 750
TD travel mm: -
mm: (2,8...4,5)
3rd speed 1/min: 1000
TD travel mm: 5,3...6,1
mm: (5,0...6,4)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Supply-pump pressure bar: 0,8...1,4
2nd speed 1/min: 500
Supply-pump pressure bar: 2,4...3,0
3rd speed 1/min: 1000
Supply-pump pressure bar: 4,5...5,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1100
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed 1/min: 1090
Del.quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1060
Del.quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1050
Del.quantity cm3/: -
1000H.: (28,0...38,0)
6th speed 1/min: 1000
Del.quantity cm3/: 44,5...47,5
1000H.: (43,0...49,0)
7th speed 1/min: 900
Del.quantity cm3/: -
1000H.: (45,0...51,0)
8th speed 1/min: 750
Del.quantity cm3/: 45,0...49,0
1000H.: (43,3...50,7)
9th speed 1/min: 500
Del.quantity cm3/: 33,0...41,0
1000H.: (33,3...40,7)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:
Speed 1/min: 375
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: -
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 200
Del.quantity cm3/: -
ind. 1000H.: 45,0

2nd speed 1/min: 370
Del. quantity cm³/: -
ax. 1000H: 50,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 A
Edition : 12.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R241
Type number : 0 460 426 085

Customer-specific information
Customer : PERKINS

Engine : T6.60

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000

Setting value bar: 7,2...7,8

Full-load del. with charge press.:

Speed 1/min: 1000
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 90,5...91,5
Dispersion cm3/ : 3,5
1000H : (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 700
Del. quantity cm3/
1000H.: 80,5...81,5

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm3/
1000H.: 13,0...17,0
Dispersion cm3/ : 3,5
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1400
Charge press. hPa: 1000
Del. quantity cm3/
1000H: 52,0...58,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 90,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 950
Charge press. hPa: 1000
TD travel mm: 0,5...1,1
mm: (0,1...1,5)
2nd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: -
mm: (1,6...3,0)
3rd speed 1/min: 1300
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1000

Supply-pump
pressure bar: 4,7...5,3
2nd speed 1/min: 1300
Charge press. hPa: 1000
Supply-pump
pressure bar: 8,0...8,6

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: 1000
Overflow : 41...138
quantity cm3/10s: (26...153)
2nd speed 1/min: 1300
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 350
Del. quantity cm3/: 86,5...87,5
1000H.: (84,0...90,0)
2nd speed 1/min: 1530
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 1480
Charge press. hPa: 1000
Del. quantity cm3/: 7,5...16,5
1000H.: (7,0...17,0)
4th speed 1/min: 1400
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (50,0...60,0)
5th speed 1/min: 1300
Charge press. hPa: 1000
Del. quantity cm3/: 81,0...84,0
1000H.: (79,5...85,5)
6th speed 1/min: 1000
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (88,0...94,0)
7th speed 1/min: 700
Charge press. hPa: 1000
Del. quantity cm3/: 89,0...92
1000H.: (86,8...94,2)
8th speed 1/min: 700
Charge press. hPa: -
Del. quantity cm3/: -
1000H.: (77,3...84,7)
9th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm3/: 70,5...75,5
1000H.: (69,3...76,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 1300
ELAB volt: -
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: -
1000H.: (10,0..20,0)
2nd speed 1/min: 400
Del.quantity cm3/: 4,0...10,0
1000H.: (2,0...12,0)
3rd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 150
Del.quantity cm3/: -
ind. 1000H: 100,0
2nd speed 1/min: 250
Del.quantity cm3/: -
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-0T
MS	mm	:	1,1..1,35
SVS max.	mm	:	1,3
XK	mm	:	17,0...19,0
XL	mm	:	10,5...13,9

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L2
Edition : 10.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R173-5
Type number : 0 460 426 086

Customer-specific information
Customer : CUMMINS

Engine : 6BTA-5,9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC) : $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Charge press. hPa: 1000
Setting value mm: 1,9...2,3

Supply-pump pressure:

Speed 1/min: 900
Charge press. hPa: 1000

Setting value bar: 4,4...5,0

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 81,5...82,5
Dispersion cm³/ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm³/
1000H.: 42,5...43,5

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del. quantity cm³/
1000H.: 8,0...14,0
Dispersion cm³/ : -
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1200
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 60,5...66,5

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: -
mm: (1,4...2,8)
3rd speed 1/min: 1150
Charge press. hPa: 1000
TD travel mm: 2,5...3,3
mm: (2,2...3,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1000

Supply-pump
pressure bar: 2,7...3,3
2nd speed 1/min: 1150
Charge press. hPa: 1000
Supply-pump
pressure bar: 5,5...6,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (267...98)
2nd speed 1/min: 1150
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 400
Del. quantity cm³/ : 68,5...69,5
1000H.: (66,0...72,0)
2nd speed 1/min: 1280
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: 0...3,0

3rd speed 1/min: 1260
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: 0...15,0
4th speed 1/min: 1240
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: 0...15,0

5th speed 1/min: 1200
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: (58,5...68,5)

6th speed 1/min: 1150
Charge press. hPa: 1000
Del. quantity cm³/ : 76,0...79,0
1000H.: (74,5...80,5)

7th speed 1/min: 900
Charge press. hPa: 1000
Del. quantity cm³/ : 79,5...82,5
1000H.: (78,0...84,0)

8th speed 1/min: 750
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: (79,0...84,0)

9th speed 1/min: 500
Charge press. hPa: 1000
Del. quantity cm³/ : 80,0...88,0
1000H.: (80,3...87,3)

10th speed 1/min: 500
Charge press. hPa: -

Del. quantity cm³/: -
1000H: (40,0...46,0)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del. quantity cm³/: -
1000H.

Electr. shutoff:
Speed 1/min: 375
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del. quantity cm³/: 19,0...31,0
1000H.: (20,0...30,0)
2nd speed 1/min: 375
Del. quantity cm³/: -
1000H.: (6,0...16,0)
3rd speed 1/min: 500
Del. quantity cm³/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del. quantity cm³/: -
ind. 1000H: 70,0
2nd speed 1/min: 280
Del. quantity cm³/: -
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,1...5,4
MS mm : 1,3...1,55
SVS max. mm : 2,4
XK mm : 18,8...20,8
XL mm : 11,6...15,0

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L3
Edition : 10.12.86
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1050 R173-6
Type number : 0 460 426 087

Customer-specific information
Customer : CUMMINS

Engine : 6BTA-5,9

Power k: 125
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1,4...1,8

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3,3...3,9

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 82,5...83,5
Dispersion cm³/
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm³/
1000H.: 41,0...42,0
Dispersion cm³/
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del. quantity cm³/
1000H.: 8,0...14,0
Dispersion cm³/
1000H.: -

Full-load speed regulation:

Speed 1/min: 1100
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 59,0...65,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0,5...1,3
mm: (0,2...1,6)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: -
mm: (0,9...2,3)
3rd speed 1/min: 1050
Charge press. hPa: 1000

TD travel mm: 2,1...2,9
mm: (1,8...3,2)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Charge press. hPa: 1000
Supply-pump pressure bar: 0,8...1,4
2nd speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2,3...2,9
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4,5...5,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 400
Del.quantity cm³/: 70,5...71,5
1000H.: (68,0...74,0)
2nd speed 1/min: 1180
Charge press. hPa: 1000
Del.quantity cm³/: -
1000H.: 0...3,0
3rd speed 1/min: 1150
Charge press. hPa: 1000
Del.quantity cm³/: -
1000H.: 0...15,0
4th speed 1/min: 1120
Charge press. hPa: 1000
Del.quantity cm³/: -
1000H.: 0...15,0
5th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: -
1000H.: (57,0...67,0)
6th speed 1/min: 1050
Charge press. hPa: 1000
Del.quantity cm³/: 77,5...80,5
1000H.: (76,0...82,0)
7th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/: 78,0...81,0
1000H.: (76,5...82,5)
8th speed 1/min: 750

Charge press. hPa: 1000
Del.quantity cm³/: -
1000H.: (80,0...86,0)
9th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 80,5...88,5
1000H.: (80,8...88,2)
10th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: -
1000H.: (38,5...44,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del.quantity cm³/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: -
1000H.: (6,0...16,0)
2nd speed 1/min: 500
Del.quantity cm³/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm³/: -
ind. 1000H: 55,0
2nd speed 1/min: 350
Del.quantity cm³/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,3...1,55
SVS max.	mm	:	2,0
XK	mm	:	18,8...20,8
XL	mm	:	12,2...15,6

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 A1
Edition : 15.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R241-1
Type number : 0 460 426 088

Customer-specific information
Customer : PERKINS

Engine : T6.60

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000

Setting value bar: 7,2...7,8

Full-load del. with charge press.:

Speed 1/min: 1000
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 83,0...84,0
Dispersion cm3/ : 3,5
1000H.: (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 700
Del. quantity cm3/
1000H.: 76,0...77,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm3/
1000H.: 13,0...17,0
Dispersion cm3/: 3,5
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1400
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 52,0...58,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 88,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 950
Charge press. hPa: 1000
TD travel mm: 0,5...1,1
mm: (0,1...1,5)
2nd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: -
mm: (1,6...3,0)
3rd speed 1/min: 1300
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1000

Supply-pump
pressure bar: 4,7...5,3
2nd speed 1/min: 1300
Charge press. hPa: 1000
Supply-pump
pressure bar: 8,0...8,6

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: 1000
Overflow : 41...138
quantity cm3/10s: (26...153)
2nd speed 1/min: 1300
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 250
Del. quantity cm3/: 80,5...81,5
1000H.: (78,0...84,0)
2nd speed 1/min: 1530
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 1480
Charge press. hPa: 1000
Del. quantity cm3/: 12,0...20,0
1000H.: (11,0...21,0)
4th speed 1/min: 1400
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (50,0...60,0)
5th speed 1/min: 1300
Charge press. hPa: 1000
Del. quantity cm3/: 74,0...77,0
1000H.: (72,5...78,5)
6th speed 1/min: 1000
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (80,5...86,5)
7th speed 1/min: 700
Charge press. hPa: 1000
Del. quantity cm3/: 82,0...85,0
1000H.: (79,8...87,2)
8th speed 1/min: 700
Charge press. hPa: -
Del. quantity cm3/: -
1000H.: (72,8...80,2)
9th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm3/: 68,5...71,5
1000H.: (66,3...73,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300

Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 350

Del. quantity cm³/: -
1000H.: (10,0...20,0)

2nd speed 1/min: 400

Del. quantity cm³/: 4,0...10,0
1000H.: (2,0...12,0)

3rd speed 1/min: 450

Del. quantity cm³/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 150

Del. quantity cm³/: -
ind. 1000H: 100,0

2nd speed 1/min: 250

Del. quantity cm³/: -
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-0T
MS	mm	:	1,1...1,35
SVS max.	mm	:	1,3
XK	mm	:	17,0...19,0
XL	mm	:	10,5...13,9

Remarks:

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 B
Edition : 15.12.86
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1300 R247
Type number : 0 460 426 090
Customer-specific information
Customer : PERKINS
Engine : NA6.60

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50
Inlet press., bar : 0.2
Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 901

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,5
(from BDC) : +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Setting value mm: 1,8...2,2

Supply-pump pressure:

Speed 1/min: 1100
Setting value bar: 5,2...5,8

Full-load del. w/out charge press.:

Speed 1/min : 1000
Del.quantity cm3/
1000H.: 76,5...77,5
Dispersion cm3/: 3,5
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 300
Del.quantity cm3/
1000H.: 19,5...23,5
Dispersion cm3/: 3,5
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1400
Del.quantity cm3/
1000H.: 44,5...50,5

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 80,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 950
TD travel mm: 0,6...1,2
mm: (0,2...1,6)
2nd speed 1/min: 1100
TD travel mm: -
mm: (1,3...2,7)
3rd speed 1/min: 1300
TD travel mm: 2,8...3,6
mm: (2,5...3,9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,7....3,3
2nd speed 1/min: 1300
Supply-pump
pressure bar: 6,1...6,7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1300
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1530
Del. quantity cm³/: -
1000H.: 0...2,5
3rd speed 1/min: 1480
Del. quantity cm³/: 11,5...19,5
1000H.: (10,5...20,5)
4th speed 1/min: 1400
Del. quantity cm³/: -
1000H.: (42,5...52,5)
5th speed 1/min: 1300
Del. quantity cm³/: 68,5...71,5
1000H.: (67,0...73,0)
6th speed 1/min: 1000
Del. quantity cm³/: -
1000H.: (74,0...80,0)
7th speed 1/min: 700
Del. quantity cm³/: 71,8...74,2
1000H.: (69,3...76,7)
8th speed 1/min: 500
Del. quantity cm³/: 65,0...68,0
1000H.: (62,8...70,2)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300
Del. quantity cm³/: -
1000H.:

Idle delivery:

1st speed 1/min: 300
Del. quantity cm³/: -
1000H.: (16,5...26,5)
2nd speed 1/min: 350
Del. quantity cm³/: 4,5...10,5
1000H.: (3,5...12,5)
3rd speed 1/min: 400
Del. quantity cm³/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 180
Del. quantity cm³/: -
ind. 1000H: 90,0
2nd speed 1/min: 250
Del. quantity cm³/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

D25

Designation

K	mm	:	-
KF	mm	:	K-0T
MS	mm	:	1,2...1,45
SVS max.	mm	:	2,2
XK	mm	:	17,0...19,0
XL	mm	:	10.6...14,0

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 B1
Edition : 15.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R247-2
Type number : O 460 426 097

Customer-specific information
Customer : PERKINS

Engine : NA6.60

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,5
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Setting value mm: 1,8...2,2

Supply-pump pressure:

Speed 1/min: 1100
Setting value bar: 5,2...5,8

Full-load del. w/out charge press.:

Speed 1/min : 1000
Del. quantity cm³/
1000H.: 76,5...77,5
Dispersion cm³/
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 300
Del. quantity cm³/
1000H.: 19,5...23,5
Dispersion cm³/
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1400
Del. quantity cm³/
1000H.: 44,5...50,5

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 80,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 950
TD travel mm: 0,6...1,2
mm: (0,2...1,6)
2nd speed 1/min: 1100
TD travel mm: -
mm: (1,3...2,7)
3rd speed 1/min: 1300
TD travel mm: 2,8...3,6
mm: (2,5...3,9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump pressure bar: 2,7...3,3
2nd speed 1/min: 1300
Supply-pump pressure bar: 6,1...6,7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow quantity cm³/10s: 41...83
(26...98)
2nd speed 1/min: 1300
Overflow quantity cm³/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1530
Del. quantity cm³/
1000H.: 0...2,5
3rd speed 1/min: 1480
Del. quantity cm³/
1000H.: (10,5...20,5)
4th speed 1/min: 1400
Del. quantity cm³/
1000H.: (42,5...52,5)
5th speed 1/min: 1300
Del. quantity cm³/
1000H.: (68,5...71,5)
6th speed 1/min: 1000
Del. quantity cm³/
1000H.: (74,0...80,0)
7th speed 1/min: 700
Del. quantity cm³/
1000H.: (69,3...76,7)
8th speed 1/min: 500
Del. quantity cm³/
1000H.: (62,8...70,2)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 1300
Del. quantity cm³/
1000H.: -

Idle delivery:

1st speed 1/min: 300
Del. quantity cm³/
1000H.: (16,5...26,5)
2nd speed 1/min: 350
Del. quantity cm³/
1000H.: (3,5...12,5)
3rd speed 1/min: 400
Del. quantity cm³/
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 180
Del. quantity cm³/
ind. 1000H.: 90,0
2nd speed 1/min: 250
Del. quantity cm³/
ax. 1000H.: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : -
Rated voltage : -

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-0T
MS	mm	:	1,2...1,45
SVS max.	mm	:	2,2
XK	mm	:	17,0...19,0
XL	mm	:	10.6...14,0

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 6,5K2
Edition : 16.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1200 R265
Type number : 0 460 426 099

Customer-specific information
Customer : STEYR

Engine : WD 612.61

Power k: 100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 800
Setting value bar: 5,9...6,5

Full-load del. w/out charge press.:

Speed 1/min : 1000
Del.quantity cm3/
1000H.: 83,0...84,0

Dispersion cm3/: 3,5
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 300
Del.quantity cm3/
1000H.: 13,0...23,0
Dispersion cm3/: 3,5
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1300
Del.quantity cm3/
1000H.: 15,0...21,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 90,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
TD travel mm: 0,8...1,4
mm: (0,4...1,8)
2nd speed 1/min: 800
TD travel mm: -
mm: (1,8...3,2)
3rd speed 1/min: 1200
TD travel mm: 2,8...3,6
mm: (2,5...3,9)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump pressure bar: 5,0...5,6
2nd speed 1/min: 1200
Supply-pump pressure bar: 7,6...8,2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow quantity cm3/10s: 41...83
(26...98)
2nd speed 1/min: 1200
Overflow quantity cm3/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1330
Del.quantity cm3/: -
1000H.: 0...2,5

3rd speed 1/min: 1300
Del.quantity cm3/: -
1000H.: (13,0...23,0)
4th speed 1/min: 1200
Del.quantity cm3/: 80,5...83,5
1000H.: (79,0...85,0)
5th speed 1/min: 1000
Del.quantity cm3/: -
1000H.: (80,5...86,5)
6th speed 1/min: 800
Del.quantity cm3/: 80,2...82,8
1000H.: (78,3...85,2)
7th speed 1/min: 500
Del.quantity cm3/: 76,5...79,5
1000H.: (74,3...81,7)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 1200
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 300
Del.quantity cm3/: -
1000H.: (13,0...23,0)
2nd speed 1/min: 350
Del.quantity cm3/: 1,0...7,0
1000H.: -
3rd speed 1/min: 400
Del.quantity cm3/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 170
Del.quantity cm3/: -
ind. 1000H.: 90,0
2nd speed 1/min: 250
Del.quantity cm3/: -
ax. 1000H.: 65,0

Shutoff electromagnet:

Cut-in
min. voltage : -
Rated voltage : -

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,7...6,0
MS mm : 1,3...1,55
SVS max. mm : 5,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L4
Edition : 11.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R173-8
Type number : 0 460 426 101

Customer-specific information
Customer : CUMMINS

Engine : 6BTA-5,9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1,4...1,8

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000

Setting value bar: 3,2...3,8

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 84,0...87,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min: 500
Del. quantity cm3/
1000H.: 41...42,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del. quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1300
Charge press. hPa: 1000
Del. quantity cm3/
1000H.: 61,0...67,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0,4...1,2
mm: (0,1...1,5)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: -
mm: (0,9...2,3)
3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 2,3...3,1
mm: (2,0...3,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500

E05

Charge press. hPa: 1000

Supply-pump
pressure bar: 2,1...2,7
2nd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump
pressure bar: 4,3...4,9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 450
Del. quantity cm3/: 68,0...69,0
1000H.: (65,5...71,5)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 1370
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...15,0
4th speed 1/min: 1330
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: 0...15,0
5th speed 1/min: 1300
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (59,0...69,0)
6th speed 1/min: 1250
Charge press. hPa: 1000
Del. quantity cm3/: 75,0...78,0
1000H.: (73,5...79,5)
7th speed 1/min: 1050
Charge press. hPa: 1000
Del. quantity cm3/: 80,5...83,5
1000H.: (79,0...85,0)
8th speed 1/min: 750
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (81,5...87,5)
9th speed 1/min: 500
Charge press. hPa: 1000
Del. quantity cm3/: 84,5...92,5
1000H.: (84,8...92,2)
10th speed 1/min: 500
Charge press. hPa: -

Del. quantity cm³/: -
1000H: (38,5...44,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm³/: -
1000H.

Electr. shutoff:

Speed 1/min: 375
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del. quantity cm³/: -
1000H.: (6,0...16,0)
2nd speed 1/min: 500
Del. quantity cm³/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 200
Del. quantity cm³/: -
ind. 1000H: 60,0
2nd speed 1/min: 350
Del. quantity cm³/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : -
Rated voltage : -

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,3...1,55
SVS max.	mm	: 2,2
XK	mm	: 18,8...20,8
XL	mm	: 12,9...16,3

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,7 A
Edition : 16.12.86
replaces : 9.85
Calibrating oil : ISO 4113

Injection pump : VE 4/8F2300 R171
Type number : 0 460 484 010

Customer-specific information
Customer : PEUGEOT

Engine : XUD 7

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

Speed 1/min : 1250
Del.quantity cm3/
1000H.: 28,0...29,0
Dispersion cm3/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...12,0
Dispersion cm3/: 2,0
1000H.: (3,0)
Residual-Delivery Setting
Speed 1/min: 550
Del.quantity cm3/
1000H.: 3,5...4,5

Full-load speed regulation:

Speed 1/min: 2400
Del.quantity cm3/
1000H.: 19,0...25,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 42,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 1250
TD travel mm: -
mm: (2,9...4,3)
3rd speed 1/min: 2000
TD travel mm: 7,5...8,3
mm: (7,2...8,6)

Supply-pump pressure characteristic:

1st speed 1/min: 800
Supply-pump
pressure bar: 3,0...3,6
2nd speed 1/min: 1250
Supply-pump
pressure bar: 4,3...4,9
3rd speed 1/min: 2000
Supply-pump
pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 800

Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2300
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650
Del.quantity cm3/: -
1000H.: 0...7,0
3rd speed 1/min: 2500
Del.quantity cm3/: 11,5...17,5
1000H.: (10,5...18,5)
4th speed 1/min: 2400
Del.quantity cm3/: -
1000H.: (18,0...26,0)
5th speed 1/min: 2250
Del.quantity cm3/: 27,0...29,0
1000H.: (25,8...30,2)
6th speed 1/min: 2000
Del.quantity cm3/: 27,5...29,5
1000H.: (26,3...30,7)
7th speed 1/min: 1250
Del.quantity cm3/: -
1000H.: (26,3...30,7)
8th speed 1/min: 800
Del.quantity cm3/: 28,0...30,0
1000H.: (26,8...31,2)
9th speed 1/min: 500
Del.quantity cm3/: 28,0...31,0
1000H.: (26,5...32,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2300
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: -
1000H.: (6,0...14,0)

High Idle:

Speed 1/min: 450
Del.quantity cm3/: 8,0...12,0
1000H.: (6,0...14,0)

Residual:

Speed 1/min: 550
Del.quantity : -
1000H.: 0...8,0

Automatic starting fuel delivery:

1st speed 1/min: 200
Del.quantity cm3/: -
ind. 1000H: 44,0

2nd speed 1/min: 300
Del.quantity cm3/: -
ax. 1000H: 34,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,2...5,5
MS	mm	: 1,3...1,5
SVS max.	mm	: 3,0
XK	mm	: 18,9...20,9
XL	mm	: 12,2...15,6

Setting of residual delivery.

Idle setting (LFG) according to
VDT-I-460/135.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,3 A
Edition : 02.04.87
replaces : 4.86
Calibrating oil : ISO 4113

Injection pump : VE 4/8F2450 L212
Type number : 0 460 484 011

Customer-specific information
Customer : VW

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,5...4,9

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,4...6,0

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 23,5...24,5
Dispersion cm3/: 2,0
1000H.: (3,0)

Low-idle speed regulation:

E09

Speed 1/min: 400
Del.quantity cm3/
1000H.: 14,5...16,5
Dispersion cm3/: 2,0
1000H.: (3,0)
Residual-Delivery Setting
Speed 1/min: 575
Del.quantity cm3/
1000H.: 2,5...3,5
Full-load speed regulation:

Speed 1/min: 2600
Del.quantity cm3/
1000H.: 8,0...14,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 32,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 2,0...2,8
mm: (1,7...3,1)
2nd speed 1/min: 1500
TD travel mm: -
mm: (4,0...5,4)
3rd speed 1/min: 2000
TD travel mm: 6,9...7,7
mm: (7,6...8,0)
4th speed 1/min: 2450
TD travel mm: 8,6...9,4
mm: (8,3...9,7)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 3,1...4,1
2nd speed 1/min: 2450
Supply-pump
pressure bar: 7,7...8,5

Overflow quantity at overflow valve:

1st speed 1/min: 600
Oveflow : 55...70
quantity cm3/10s: (50...75)
2nd speed 1/min: 2450
Overflow : 82...112
quantity cm3/10s: (77...117)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2800
Del. quantity cm3/: -
1000H.: 0...6,0
3rd speed 1/min: 2550
Del. quantity cm3/: 10,5...20,5
1000H.: (9,5...21,5)
4th speed 1/min: 2600
Del. quantity cm3/: -
1000H.: (7,0...15,0)
5th speed 1/min: 2450
Del. quantity cm3/: 19,0...21,0
1000H.: (17,8...22,2)
6th speed 1/min: 1500
Del. quantity cm3/: -
1000H.: (21,8...26,2)
7th speed 1/min: 600
Del. quantity cm3/: 15,0...18,0
1000H.: (13,5...19,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del. quantity cm3/: -
1000H.:

Electr. shutoff:
Speed 1/min: 450
Del. quantity cm3/: -
1000H.:

Idle delivery:

1st speed 1/min: 400
Del. quantity cm3/: -
1000H.: (11,5...19,5)
2nd speed 1/min: 450
Del. quantity cm3/: 5,5...8,5
1000H.: (3,0...11,0)

Residual:
Speed 1/min: 525
Del. quantity : 2,3...4,3
1000H.: (0,8...5,8)

Automatic starting fuel delivery:

1st speed 1/min: 250
Del. quantity cm3/: -
ind. 1000H: 25,0
2nd speed 1/min: 400
Del. quantity cm3/: -
ax. 1000H: 28,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,3...1,5
SVS max.	mm	: 4,9

Remarks:

Setting of residual delivery.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,3H5
Edition : 18.12.86
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/8F2000 R61-1
Type number : 0 460 484 012

Customer-specific information
Customer : FIAT PANDA

Engine : X8/29

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1600
Setting value mm: 4,8...5,2

Supply-pump pressure:

Speed 1/min: 1600
Setting value bar: 6,4...7,0

Full-load del. w/out charge press.:

Speed 1/min : 1200
Del.quantity cm3/
1000H.: 22,5...23,5
Dispersion cm3/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm3/
1000H.: 9,0...13,0
Dispersion cm3/: 2,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 2100
Del.quantity cm3/
1000H.: 11,5...18,5

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 28,0

Load-dependent start of delivery:

Speed 1/min: 1600

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
TD travel mm: 0,5...1,3
mm: (0,2...1,6)
2nd speed 1/min: 1600
TD travel mm: -
mm: (4,3...5,7)
3rd speed 1/min: 2000
TD travel mm: 6,2...7,0
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 3,3...3,9
2nd speed 1/min: 2000
Supply-pump
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Oveflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:
1st speed 1/min: 2300

Del.quantity cm3/: -
 1000H.: 0...2,0
 3rd speed 1/min: 2150
 Del.quantity cm3/: 5,0...11,0
 1000H.: (4,0...12,0)
 4th speed 1/min: 2100
 Del.quantity cm3/: -
 1000H.: (11,0...19,0)
 5th speed 1/min: 2000
 Del.quantity cm3/: 18,2...20,8
 1000H.: (17,3...21,7)
 6th speed 1/min: 1600
 Del.quantity cm3/: 19,3...21,8
 1000H.: (18,3...22,7)
 7th speed 1/min: 1200
 Del.quantity cm3/: -
 1000H.: (20,8...25,2)
 8th speed 1/min: 600
 Del.quantity cm3/: 18,5...21,5
 1000H.: (17,0...23,0)

Zero delivery (stop):

Mech. shutoff:
 Speed 1/min: -
 Del.quantity cm3/: -
 1000H.:

Electr. shutoff:
 Speed 1/min: 2000
 ELAB volt: -
 Del.quantity cm3/: -
 1000H.:

Idle delivery:

1st speed 1/min: 350
 Del.quantity cm3/: -
 1000H.: (7,0...15,0)
 2nd speed 1/min: 450
 Del.quantity cm3/: -
 1000H.: 0...4,0
 3rd speed 1/min: 550
 Del.quantity cm3/: -
 1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 350
 Del.quantity cm3/: -
 ind. 1000H.: 26,0
 2nd speed 1/min: 450
 Del.quantity cm3/: -
 ax. 1000H.: 26,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 6,1...6,2
MS	mm	: 1,4...1,65
SVS max.	mm	: -

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,0 D
Edition : 10.12.86
replaces : 10.84
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2200 R69
Type number : 0 460 494 055

Customer-specific information
Customer : RENAULT

Engine : J 8 S-702

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value bar: 5,1...5,7

Full-load del. with charge press.:

Speed 1/min: 1400
Charge press. hPa: 800

Del. quantity cm³/
1000H.: 48,6...49,6
Dispersion cm³/
1000H.: (3,0)

Full-load del. w/out charge press.:

Speed 1/min: 600
Del. quantity cm³/
1000H.: 37,6...38,6

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm³/
1000H.: 9,0...13,0
Dispersion cm³/
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 23,0...29,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 800
TD travel mm: 1,9...2,7
mm: (1,6...3,0)
2nd speed 1/min: 1400
Charge press. hPa: 800
TD travel mm: -
mm: (3,5...4,9)
3rd speed 1/min: 1800
Charge press. hPa: 800
TD travel mm: 5,7...6,5
mm: (5,4...6,8)
4th speed 1/min: 2000
Charge press. hPa: 800
TD travel mm: 6,2...7,0
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Charge press. hPa: 800

Supply-pump
pressure bar: 1,9...2,5
2nd speed 1/min: 1800
Charge press. hPa: 800
Supply-pump
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 600
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2200
Charge press. hPa: 800
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 200
LDA stroke mm: 4,5
Del. quantity cm³/
1000H.: (39,6...44,8)
2nd speed 1/min: 2700
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 0...2,0
3rd speed 1/min: 2500
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 0...17,5
4th speed 1/min: 2400
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (22,0...30,0)
5th speed 1/min: 2000
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (43,9...48,3)
6th speed 1/min: 1400
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (46,9...51,3)
7th speed 1/min: 1000
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (44,1...50,1)
9th speed 1/min: 600
Charge press. hPa: -
Del. quantity cm³/
1000H.: (35,9...40,3)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del. quantity cm³/
1000H.

Electr. shutoff:
Speed 1/min: 2200
ELAB volt: -
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 480
Del.quantity cm3/: -
1000H.: 0...2,0
2nd speed 1/min: 375
Del.quantity cm3/: 4,0...8,0
1000H.: (2,0...10,0)
3rd speed 1/min: 350
Del.quantity cm3/: -
1000H.: (7,0...15,0)

Automatic starting fuel delivery:

1st speed 1/min: 180
Del.quantity cm3/: -
ind. 1000H: 40,0
2nd speed 1/min: 300
Del.quantity cm3/: -
ax. 1000H: 40,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2-3,4
KF	mm	: 5,7-5,9
MS	mm	: 1,4-1,6
SVS max.	mm	: 5,3
XK	mm	: 20,2-22,2
XL	mm	: 9,1-12,4

Correction at adjusting nut (46)
emarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,5 A
Edition : 10.12.86
replaces : 3.85
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2250 R84
Type number : 0 460 494 079

Customer-specific information
Customer : PEUGEOT

Engine : XD3 505 D

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 5,0...5,6

Full-load del. w/out charge press.:

Speed 1/min : 1250
Del.quantity cm3/
1000H.: 38,5...39,5
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 6,0...10,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2325
Del.quantity cm3/
1000H.: 25,5...31,5

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
2nd speed 1/min: 1250
TD travel mm: -
mm: (3,5...4,9)
3rd speed 1/min: 2000
TD travel mm: 8,1...8,9
mm: (7,8...9,2)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Supply-pump
pressure bar: 2,1...2,7
2nd speed 1/min: 2200
Supply-pump
pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 400
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2250
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:
1st speed 1/min: 2550

Del. quantity cm3/: -
1000H.: 0...2,0
2nd speed 1/min: 2450
Del. quantity cm3/: 4,5...12,5
1000H.: (4,5...12,5)
3rd speed 1/min: 2325
Del. quantity cm3/: -
1000H.: (24,5...32,5)
4th speed 1/min: 2200
Del. quantity cm3/: 39,0...41,0
1000H.: (37,8...42,2)
5th speed 1/min: 2000
Del. quantity cm3/: 38,5...40,5
1000H.: (37,3...41,7)
6th speed 1/min: 1250
Del. quantity cm3/: -
1000H.: (36,8...41,2)
7th speed 1/min: 600
Del. quantity cm3/: 35,5...38,5
1000H.: (34,0...40,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 2250
ELAB volt: -
Del. quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 400
Del. quantity cm3/: -
1000H.: (4,0...12,0)
2nd speed 1/min: 440
Del. quantity cm3/: -
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 350
Del. quantity cm3/: -
ind. 1000H: 45,0

2nd speed 1/min: 450
Del. quantity cm3/: -
ax. 1000H: 45,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

E17

Designation

K	mm	: K1
KF	mm	: 5,2-5,4
MS	mm	: 0,9-1,2
SVS max.	mm	: 3,3
XK	mm	: 20,2-22,2
XL	mm	: 9,9-13,3

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0 E
Edition : 02.04.87
replaces : 7.84
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2400 R95
Type number : O 460 494 105

Customer-specific information
Customer : RENAULT

Engine : F8M

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400
Setting value mm: 4,1...4,5
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1400
Setting value bar: 4,9...5,5
KSB solenoid-operated
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 1000

Del. quantity cm³/
1000H.: 28,5...29,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 425
Del. quantity cm³/
1000H.: 6,0...10,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/: 2,0
1000H.: -

Full-load speed regulation:

Speed 1/min: 2550
Del. quantity cm³/
1000H.: 21,0...29,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 42,0
KSB solenoid-operated
valve volt: 12,0

Load-dependent start of delivery:

Speed 1/min: 1400
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
TD travel mm: 0,7...1,5
mm: (0,4...1,8)

KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 1000
TD travel mm: 2,3...3,1
mm: (2,0...3,4)

KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1400
TD travel mm: -
mm: (3,6...5,0)

KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 2000

TD travel mm: 6,3...7,1
mm: (6,0...7,4)

KSB solenoid-operated
valve volt: 12,0
5th speed 1/min: 2100
TD travel mm: 6,7...7,5
mm: (6,4...7,8)

KSB solenoid-operated
valve volt: 12,0
6th speed 1/min: 2400
TD travel mm: 7,0...7,7
mm: (6,6...8,0)

KSB solenoid-operated
valve volt: 12,0

Mfg. date: from : -
1st speed 1/min: 300
TD travel mm: 2,0...4,0
mm: -

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 2,5...3,1
KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 2400
Supply-pump
pressure bar: 7,7...8,3
KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 600
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...70
quantity cm³/10s: (50...75)
2nd speed 1/min: 2400
KSB solenoid-operated
valve volt: 12,0
Overflow : 82...112
quantity cm³/10s: (77...118)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2850
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
1000H.: 0...7,0
2nd speed 1/min: 2700
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 10,5...16,5
1000H.: (9,5...17,5)
3rd speed 1/min: 2550
KSB solenoid-operated
valve volt: 12,0

Del.quantity cm3/: 21,0...29,0
 1000H.: (21,0...29,0)
 4th speed 1/min: 2400
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 29,7...32,3
 1000H.: (28,7...33,3)
 5th speed 1/min: 2100
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 20,3...32,7
 1000H.: (29,2...33,8)
 6th speed 1/min: 1400
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 27,8...29,8
 1000H.: (26,5...31,1)
 7th speed 1/min: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: -
 1000H.: (26,7...31,3)
 8th speed 1/min: 600
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 26,9...29,9
 1000H.: (25,4...31,4)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
 Del.quantity cm3/: -
 1000H.

Electr. shutoff:

Speed 1/min: 425
 ELAB volt: -
 Del.quantity cm3/: 3
 1000H.

Idle delivery:

1st speed 1/min: 425
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: -
 1000H.: (4,0...12,0)
 2nd speed 1/min: 600
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 0,5...5,5
 1000H.: (0...6,0)
 3rd speed 1/min: 650
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: -
 1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 330
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: -
 ind. 1000H: 30,0

2nd speed 1/min: 500
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: -
 ax. 1000H: 31,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...5,9
MS	mm	: 1,2...1,4
SVS max.	mm	: 2,8
XK	mm	: 18,7...20,7
XL	mm	: 9,5...12,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,3 K
Edition : 3.10.86
replaces : 9.85
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2075 R126
Type number : 0 460 494 121

Customer-specific information
Customer : PEUGEOT

Engine : XD 3S

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 800
Setting value mm: 5,8-6,2

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 800
Setting value bar: 5,6-6,2

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 800

Del. quantity cm³/
1000H.: 53,5-54,5
Dispersion cm³/
1000H.: 2,5

Full-load del. w/out charge press.:

Speed 1/min: 500
Del. quantity cm³/
1000H.: 40,0-41,0

Low-idle speed regulation:

Speed 1/min: 350
Del. quantity cm³/
1000H.: 20,0-24,0
Dispersion cm³/
1000H.: 2,0

Full-load speed regulation:

Speed 1/min: 2300
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 26,5-32,5

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 67,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 800
TD travel mm: 0,8-1,6
mm: (0,5-1,9)
2nd speed 1/min: 1000
Charge press. hPa: 800
TD travel mm: 2,5-3,3
mm: (2,2-3,6)
3rd speed 1/min: 1500
Charge press. hPa: 800
TD travel mm: -
mm: (5,3-6,7)
4th speed 1/min: 2000
Charge press. hPa: 800
TD travel mm: 7,8-8,6
mm: (7,5-8,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Charge press. hPa: 800
Supply-pump
pressure bar: 1,4-2,0

2nd speed 1/min: 750
Charge press. hPa: 800
Supply-pump pressure bar: 3,4-4,0
3rd speed 1/min: 2000
Charge press. hPa: 800
Supply-pump pressure bar: 7,1-7,7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41-83
quantity cm3/10s: (26-98)
2nd speed 1/min: 2075
Charge press. hPa: 800
Overflow : 55-138
quantity cm3/10s: (40-153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750
Charge-air pressure-setting point hPa: 300
LDA stroke mm: 4,5
Del.quantity cm3/: 47,5-48,5
1000H.: (45,8-50,2)

2nd speed 1/min: 2600
Charge press. hPa: 800
Del.quantity cm3/: -
1000H.: 0...1,0

3rd speed 1/min: 2300
Charge press. hPa: 800
Del.quantity cm3/: 26,5-32,5
1000H.: (25,5-33,5)

4th speed 1/min: 2200
Charge press. hPa: 800
Del.quantity cm3/: 39,5-45,5
1000H.: (38,5-46,5)

5th speed 1/min: 2000
Charge press. hPa: 800
Del.quantity cm3/: 52,0-54,0
1000H.: (50,8--55,2)

6th speed 1/min: 1500
Charge press. hPa: 800
Del.quantity cm3/: -
1000H.: (51,8-56,2)

7th speed 1/min: 1000
Charge press. hPa: 800
Del.quantity cm3/: 50,5-53,5
1000H.: (49,8-54,2)

8th speed 1/min: 750
Charge press. hPa: -
Del.quantity cm3/: 41,5-44,5
1000H.: (40,8-45,2)

9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm3/: 40,0-41,0
1000H.: (38,3-42,7)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:
Speed 1/min: 400
ELAB volt: -
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: -
1000H.: (18,0-26,0)
2nd speed 1/min: 400
Del.quantity cm3/: 8,0-12,0
1000H.: (6,0-14,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...1,0

Automatic starting fuel delivery:

1st speed 1/min: 230
Del.quantity cm3/: -
ind. 1000H: 60,0

2nd speed 1/min: 330
Del.quantity cm3/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: K1
KF	mm	: 5,4-5,7
MS	mm	: 1,2-1,4
SVS max.	mm	: 4,6
XK	mm	: 20,2-22,2
XL	mm	: 9,7-13,1

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 1,6 A
Edition : 2.10.86
replaces : 6.85
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2400 R125
Type number : D 460 494 122

Customer-specific information
Customer : FORD-KENT

Engine : 1,6L IDI

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 5,0...5,4
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,3...5,9
KSB solenoid-operated
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 1750

Del. quantity cm3/
1000H.: 29,5...30,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 440
Del. quantity cm3/
1000H.: 7,0...11,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/: 2,0
1000H.: -

Full-load speed regulation:

Speed 1/min: 2675
Del. quantity cm3/
1000H.: 7,5...13,5
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 50,0
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 1,6...2,4
mm: (1,3...2,7)

KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 1500
TD travel mm: -
mm: (4,5...5,9)

KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 2000
TD travel mm: 7,6...8,4
mm: (7,3...8,7)

KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 600
TD travel mm: 2,2...4,2
mm: -

KSB solenoid-operated
valve volt: -

Supply-pump pressure characteristic:

1st speed 1/min: 600
 Supply-pump pressure bar: 3,1...3,7
 KSB solenoid-operated valve volt: 12,0
 2nd speed 1/min: 2000
 Supply-pump pressure bar: 6,6...7,2
 KSB solenoid-operated valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 600
 KSB solenoid-operated valve volt: 12,0
 Overflow quantity : 41...83
 quantity cm3/10s: (26...98)
 2nd speed 1/min: 2400
 KSB solenoid-operated valve volt: 12,0
 Overflow quantity : 55...138
 quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2950
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: -
 1000H.: 0...2,0
 2nd speed 1/min: 2675
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: -
 1000H.: (6,5...14,5)
 3rd speed 1/min: 2550
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: 18,5...26,5
 1000H.: (18,5...26,5)
 4th speed 1/min: 2400
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: 28,1...30,1
 1000H.: (26,9...31,3)
 5th speed 1/min: 1750
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: -
 1000H.: (27,8...32,2)
 6th speed 1/min: 1000
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: 26,0...29,0
 1000H.: (25,3...29,7)
 7th speed 1/min: 600
 KSB solenoid-operated valve volt: 12,0

Del.quantity cm3/: 24,0...27,0
 1000H.: (22,5...28,5)

Zero delivery (stop):

Mech. shutoff:
 Speed 1/min: 2400
 Del.quantity cm3/: -
 1000H.

Idle delivery:

1st speed 1/min: 440
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: -
 1000H.: (5,0...13,0)
 2nd speed 1/min: 475
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: 2,5...7,5
 1000H.: (1,0...9,0)
 3rd speed 1/min: 570
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: -
 1000H.: 0...3,5

Automatic starting fuel delivery:

1st speed 1/min: 400
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: -
 ind. 1000H: 30,0
 2nd speed 1/min: 500
 KSB solenoid-operated valve volt: 12,0
 Del.quantity cm3/: -
 ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
 K mm : 3,2-3,4
 KF mm : 5,7-6,0
 MS mm : 1,6-1,85
 SVS max. mm : 3,4
 XK mm : 23,3-25,3
 XL mm : 10,4-13,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,3K3
Edition : 3.10.86
replaces : 9.85
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2125 R126-1
Type number : 0 460 494 123

Customer-specific information
Customer : PEUGEOT

Engine : XD3S AUT.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 800
Setting value mm: 5,8...6,2

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 800
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 800

Del. quantity cm³/
1000H.: 53,5...54,5
Dispersion cm³/
1000H.: 2,5

Full-load del. w/out charge press.:

Speed 1/min: 500
Del. quantity cm³/
1000H.: 40,0...41,0

Low-idle speed regulation:

Speed 1/min: 400
Del. quantity cm³/
1000H.: 17,0...21,0
Dispersion cm³/
1000H.: -

Full-load speed regulation:

Speed 1/min: 2350
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 26,5...32,5

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 67,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 800
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 1000
Charge press. hPa: 800
TD travel mm: 2,5...3,3
mm: (2,2...3,6)
3rd speed 1/min: 1500
Charge press. hPa: 800
TD travel mm: -
mm: (5,3...6,7)
4th speed 1/min: 2000
Charge press. hPa: 800
TD travel mm: 7,8...8,6
mm: (7,5...8,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Charge press. hPa: 800
Supply-pump
pressure bar: 1,4...2,0

2nd speed 1/min: 750
Charge press. hPa: 800
Supply-pump
pressure bar: 3,4...4,0
3rd speed 1/min: 2000
Charge press. hPa: 800
Supply-pump
pressure bar: 7,1...7,7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2125
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750
Charge-air pressure-setting
point hPa: 300
LDA stroke mm: 4,5
Del. quantity cm³/
1000H.: (45,8...50,2)
2nd speed 1/min: 2650
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 0...1,0
3rd speed 1/min: 2350
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (25,5...33,5)
4th speed 1/min: 2250
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (37,5...45,5)
5th speed 1/min: 2000
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (50,8...55,2)
6th speed 1/min: 1500
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (51,8...56,2)
7th speed 1/min: 1000
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (49,8...54,2)
8th speed 1/min: 750
Charge press. hPa: -
Del. quantity cm³/
1000H.: (40,8...45,2)
9th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm³/
1000H.: (38,3...42,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm³/: -
1000H.

Electr. shutoff:

Speed 1/min: 400
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 400
Del. quantity cm³/: -
1000H.: (15,0..23,0)
2nd speed 1/min: 450
Del. quantity cm³/: 5,0...9,0
1000H.: (3,0...11,0)
3rd speed 1/min: 550
Del. quantity cm³/: -
1000H.: 0...3,5

Automatic starting fuel delivery:

1st speed 1/min: 230
Del. quantity cm³/: -
ind. 1000H: 60,0
2nd speed 1/min: 330
Del. quantity cm³/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: K1
KF	mm	: 5,4...5,7
MS	mm	: 1,2...1,4
SVS max.	mm	: 4,6
XK	mm	: 20,2...22,2
XL	mm	: 9,4...12,8

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,5 A 1
 Edition : 10.12.86
 replaces : 9.85
 Calibrating oil : ISO-4113
 Injection pump : VE 4/9F2250 R84-1
 Type number : 0 460 494 125
 Customer-specific information
 Customer : PEUGEOT
 Engine : XD3 505 D

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50
 Inlet press., bar : 0.2
 Calibrating nozzle-holder
 assembly : 1 688 901 022

Opening
 pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 450

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
 Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1250
 Setting value bar: 5,0...5,6

Full-load del. w/out charge press.:

Speed 1/min : 1250
 Del.quantity cm3/
 1000H.: 38,5...39,5
 Dispersion cm3/: 2,5
 1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 400
 Del.quantity cm3/
 1000H.: 6,0...10,0
 Dispersion cm3/: 2,5
 1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2325
 Del.quantity cm3/
 1000H.: 25,5...31,5

Start:

Speed 1/min: 100
 Del.quantity mind.
 cm3/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
 TD travel mm: 0,6...1,4
 mm: (0,3...1,7)
 2nd speed 1/min: 1250
 TD travel mm: -
 mm: (3,5...4,9)
 3rd speed 1/min: 2000
 TD travel mm: 8,1...8,9
 mm: (7,8...9,2)

Supply-pump pressure characteristic:

1st speed 1/min: 400
 Supply-pump
 pressure bar: 2,1...2,7
 2nd speed 1/min: 2200
 Supply-pump
 pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 400
 Overflow : 41...83
 quantity cm3/10s: (26...98)
 2nd speed 1/min: 2250
 Overflow : 55...138
 quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2550

Del. quantity cm3/: -
1000H.: 0...2,0
2nd speed 1/min: 2450
Del. quantity cm3/: 4,5...12,5
1000H.: (4,5...12,5)
3rd speed 1/min: 2325
Del. quantity cm3/: -
1000H.: (24,5...32,5)
4th speed 1/min: 2200
Del. quantity cm3/: 39,0...41,0
1000H.: (37,8...42,2)
5th speed 1/min: 2000
Del. quantity cm3/: 38,5...40,5
1000H.: (37,3...41,7)
6th speed 1/min: 1250
Del. quantity cm3/: -
1000H.: (36,8...41,2)
7th speed 1/min: 600
Del. quantity cm3/: 35,5...38,5
1000H.: (34,0...40,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm3/: -
1000H.:

Idle delivery:

1st speed 1/min: 400
Del. quantity cm3/: -
1000H.: (4,0...12,0)
2nd speed 1/min: 440
Del. quantity cm3/: -
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 350
Del. quantity cm3/: -
ind. 1000H: 45,0
2nd speed 1/min: 450
Del. quantity cm3/: -
ax. 1000H: 45,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : K1
KF mm : 5,2-5,4
MS mm : 0,9-1,2
SVS max. mm : 3,3

XK mm : 20,2-22,2
XL mm : 9,9-13,3

Remarks:

F02

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,9 E
Edition : 16.12.86
replaces : 9.85
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 R141
Type number : 0 460 494 132

Customer-specific information
Customer : FIAT

Engine : X8/43

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 29,2...30,2
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 390
Del.quantity cm3/
1000H.: 9,0...13,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2500
Del.quantity cm3/
1000H.: 11,0...17,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 1,7...2,5
mm: (1,4...2,8)
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,8...5,2)
3rd speed 1/min: 2300
TD travel mm: 7,1...7,9
mm: (6,8...8,2)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Supply-pump pressure bar: 2,8...3,4
2nd speed 1/min: 2300
Supply-pump pressure bar: 7,4...8,0

Overflow quantity at overflow valve:

1st speed 1/min: 400
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2300
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2600

Del.quantity cm3/: 3,0...10,0
1000H.: (2,5...10,5)
3rd speed 1/min: 2500
Del.quantity cm3/: -
1000H.: (10,0...18,0)
4th speed 1/min: 2400
Del.quantity cm3/: 21,0...27,0
1000H.: (20,0...28,0)
5th speed 1/min: 2250
Del.quantity cm3/: 31,0...33,4
1000H.: (30,0...34,4)
6th speed 1/min: 1500
Del.quantity cm3/: -
1000H.: (26,5...31,9)
7th speed 1/min: 1000
Del.quantity cm3/: 28,9...31,5
1000H.: (28,0...32,4)
8th speed 1/min: 600
Del.quantity cm3/: 30,0...33,0
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 2300
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 390
Del.quantity cm3/: -
1000H.: (7,0...15,0)
2nd speed 1/min: 440
Del.quantity cm3/: 1,0...7,0
1000H.: (0...8,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm3/: -
ind. 1000H.: 45,0
2nd speed 1/min: 400
Del.quantity cm3/: -
ax. 1000H.: 46,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,1...3,4

KF	mm	:	5,7...6,0
MS	mm	:	1,7...1,9
SVS max.	mm	:	2,8
XK	mm	:	20,2...22,2
XL	mm	:	10,3...13,7

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0 K
Edition : 02.04.87
replaces : 10.84
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2200 R153
Type number : 0 460 494 141

Customer-specific information
Customer : RENAULT

Engine : J8S-709

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value bar: 5,1...5,7

Full-load del. with charge press.:

Speed 1/min: 1400
Charge press. hPa: 800

Del. quantity cm3/
1000H.: 48,2...49,2
Dispersion cm3/ : 2,5
1000H. : -

Full-load del. w/out charge press.:

Speed 1/min : 600
Del. quantity cm3/
1000H.: 37,6...38,6

Low-idle speed regulation:

Speed 1/min: 350
Del. quantity cm3/
1000H.: 9,0...13,0
Dispersion cm3/ : 2,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 2400
Charge press. hPa: 800
Del. quantity cm3/
1000H.: 23,0...29,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 800
TD travel mm: 1,9...2,7
mm: (1,6...3,0)
2nd speed 1/min: 1400
Charge press. hPa: 800
TD travel mm: -
mm: (3,5...4,9)
3rd speed 1/min: 1800
Charge press. hPa: 800
TD travel mm: 5,7...6,5
mm: (5,4...6,8)
4th speed 1/min: 2000
Charge press. hPa: 800
TD travel mm: 6,2...7,0
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Charge press. hPa: 800
Supply-pump
pressure bar: 2,7...3,2

2nd speed 1/min: 1800
Charge press. hPa: 800
Supply-pump
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 600
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2000
Charge press. hPa: 800
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 200
LDA stroke mm: 4,5
Del. quantity cm3/ : 41,5...42,5
1000H.: (39,0...45,0)
2nd speed 1/min: 2700
Charge press. hPa: 800
Del. quantity cm3/ : -
1000H.: 0...3,0
3rd speed 1/min: 2500
Charge press. hPa: 800
Del. quantity cm3/ : -
1000H.: 0...17,5
4th speed 1/min: 2400
Charge press. hPa: 800
Del. quantity cm3/ : -
1000H.: (22,0...30,0)
5th speed 1/min: 2000
Charge press. hPa: 800
Del. quantity cm3/ : 44,5...46,5
1000H.: (43,2...47,8)
6th speed 1/min: 1400
Charge press. hPa: 800
Del. quantity cm3/ : -
1000H.: (46,4...51,0)
7th speed 1/min: 1000
Charge press. hPa: 800
Del. quantity cm3/ : 46,2...49,2
1000H.: (44,7...50,7)
8th speed 1/min: 600
Charge press. hPa: -
Del. quantity cm3/ : 37,6...38,6
1000H.: (35,1...41,1)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm3/ : -
1000H.

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm3/: 3
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: -
1000H.: (7,0...15,0)
2nd speed 1/min: 375
Del.quantity cm3/: 4,0...8,0
1000H.: (2,0...10,0)
3rd speed 1/min: 480
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 180
Del.quantity cm3/: -
ind. 1000H: 40,0
2nd speed 1/min: 300
Del.quantity cm3/: -
ax. 1000H: 40,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,4...1,6
SVS max.	mm	: 3,6
XK	mm	: 17,0...19,0
XL	mm	: 10,3...13,7

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,9 D
Edition : 16.12.86
replaces : 3.84
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 L157
Type number : 0 460 494 144

Customer-specific information
Customer : FIAT

Engine : X8/48

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,4...4,8

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,1...5,7

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 33,0...34,0
Dispersion cm3/: 2,5
1000H.: (3,0)

F09

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 9,0...13,0
Dispersion cm3/: 2,0
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400
Del.quantity cm3/
1000H.: 24,0...30,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 57,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,7...1,5
mm: (0,4...1,8)
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,9...5,3)
3rd speed 1/min: 2300
TD travel mm: 8,2...9,0
mm: (7,9...9,3)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Supply-pump
pressure bar: 2,5...3,1
2nd speed 1/min: 2300
Supply-pump
pressure bar: 6,9...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 400
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2300
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:
1st speed 1/min: -

Del. quantity cm³/: -
 1000H.: -
 2nd speed 1/min: 2600
 Del. quantity cm³/: 3,0...9,0
 1000H.: (2,0...10,0)
 3rd speed 1/min: 2500
 Del. quantity cm³/: 14,0...20,0
 1000H.: (13,0...21,0)
 4th speed 1/min: 2400
 Del. quantity cm³/: -
 1000H.: (23,0...31,0)
 5th speed 1/min: 2300
 Del. quantity cm³/: 34,8...37,2
 1000H.: (33,8...38,2)
 6th speed 1/min: 1500
 Del. quantity cm³/: -
 1000H.: (31,3...35,7)
 7th speed 1/min: 1000
 Del. quantity cm³/: 32,7...35,3
 1000H.: (31,8...36,2)
 8th speed 1/min: 600
 Del. quantity cm³/: 34,0...37,0
 1000H.: (32,5...38,5)

Zero delivery (stop):

Mech. shutoff:
 Speed 1/min: 2300
 Del. quantity cm³/: -
 1000H.: -

Idle delivery:

1st speed 1/min: 400
 Del. quantity cm³/: 9,0...13,0
 1000H.: (7,0...15,0)
 2nd speed 1/min: 450
 Del. quantity cm³/: 0,5...6,5
 1000H.: (0...7,5)
 3rd speed 1/min: 500
 Del. quantity cm³/: -
 1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 300
 Del. quantity cm³/: -
 ind. 1000H.: 50,0
 2nd speed 1/min: 450
 Del. quantity cm³/: -
 ax. 1000H.: 46,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

F10

Designation

K	mm	: 3,1...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,4...1,65
SVS max.	mm	: 2,8
XK	mm	: 25,0...27,0
XL	mm	: 9,2...12,6

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0F
Edition : 02.04.87
replaces : 9.85
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2250 R158
Type number : O 460 494 145

Customer-specific information
Customer : RENAULT

Engine : J8S-706

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400
Setting value mm: 4,4...4,8

Supply-pump pressure:

Speed 1/min: 1400
Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

Speed 1/min : 1400
Del. quantity cm3/
1000H.: 35,0...36,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm3/
1000H.: 7,0...11,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400
Del.quantity cm3/
1000H.: 17,0...23,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 52,0

Load-dependent start of delivery:

Speed 1/min: 1400

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 2,6...3,4
mm: (1,3...3,7)
2nd speed 1/min: 1400
TD travel mm: -
mm: (3,9...5,3)
3rd speed 1/min: 2000
TD travel mm: 6,7...7,5
mm: (6,4...7,8)

Supply-pump pressure characteristic:

1st speed 1/min: 1000
Supply-pump pressure bar: 3,9...4,5
2nd speed 1/min: 2000
Supply-pump pressure bar: 6,5...7,1

Overflow quantity at overflow valve:

1st speed 1/min: 1000
Overflow quantity cm3/10s: 55...70
2nd speed 1/min: 2200
Overflow quantity cm3/10s: 82...112

Delivery-quant. and breakaway char.:

1st speed 1/min: 2550

Del.quantity cm3/: -
1000H.: 0...5,0
3rd speed 1/min: 2400
Del.quantity cm3/: -
1000H.: (16,0...24,0)
4th speed 1/min: 2200
Del.quantity cm3/: 37,0...39,0
1000H.: (35,7...40,3)
5th speed 1/min: 2100
Del.quantity cm3/: 37,5...39,5
1000H.: (36,2...40,8)
6th speed 1/min: 1400
Del.quantity cm3/: -
1000H.: (33,2...37,8)
7th speed 1/min: 1000
Del.quantity cm3/: 34,0...37,0
1000H.: (33,2...37,8)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 425
Del.quantity cm3/: 3
1000H.

Idle delivery:

1st speed 1/min: 425
Del.quantity cm3/: -
1000H.: (5,0...13,0)
2nd speed 1/min: 650
Del.quantity cm3/: -
1000H.: 0...5,0

Automatic starting fuel delivery:

1st speed 1/min: 370
Del.quantity cm3/: -
ind. 1000H.: 45,0
2nd speed 1/min: 480
Del.quantity cm3/: -
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4
KF mm : 5,7...5,9

MS	mm	: 1,4...1,6
SVS max.	mm	: 3,6
XK	mm	: 18,8...20,8
XL	mm	: 9,4...12,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 W18
Edition : 10.12.86
replaces : 12.85
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2250 R170
Type number : O 460 494 152

Customer-specific information
Customer : VW

Engine : 162 T -1,6L TURBO

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): +/-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 750
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 750
Setting value bar: 4,8...5,4

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 750
Del. quantity cm3/
1000H.: 42,5...43,5
Dispersion cm3/ : 2,5
1000H : (3,0)

Full-load del. w/out charge press.:

Speed 1/min : 600
Del. quantity cm3/
1000H.: 25,0...26,0

Low-idle speed regulation:

Speed 1/min: 415
Charge press. hPa: 750
Del. quantity cm3/
1000H.: 6,0...10,0
Dispersion cm3/ : 2,0
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2525
Charge press. hPa: 750
Del. quantity cm3/
1000H: 13,0...19,0

Start:

Speed 1/min: 100
Charge press. hPa: 750
Del. quantity mind.
cm3/1000H.: 35,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900
Charge press. hPa: 750
TD travel mm: 1,6...2,4
mm: (1,3...2,7)
2nd speed 1/min: 1500
Charge press. hPa: 750
TD travel mm: -
mm: (3,3...4,7)
3rd speed 1/min: 2250
Charge press. hPa: 750
TD travel mm: 6,4...7,2
mm: (6,1...7,5)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Charge press. hPa: 750

Supply-pump
pressure bar: 2,5...3,1
2nd speed 1/min: 2250
Charge press. hPa: 750
Supply-pump
pressure bar: 6,9...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 600
Charge press. hPa: 750
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2250
Charge press. hPa: 750
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 900
Charge-air pressure-setting
point hPa: 300
Del. quantity cm3/: 36,0...37,0
1000H.: (34,3...38,7)
2nd speed 1/min: 2650
Charge press. hPa: 750
Del. quantity cm3/: -
1000H.: 0...4,0
3rd speed 1/min: 2525
Charge press. hPa: 750
Del. quantity cm3/: 13,0...19,0
1000H.: (12,0...20,0)
4th speed 1/min: 2250
Charge press. hPa: 750
Del. quantity cm3/: 35,0...37,0
1000H.: (33,8...38,2)
5th speed 1/min: 1500
Charge press. hPa: 750
Del. quantity cm3/: -
1000H.: (40,8...45,2)
6th speed 1/min: 600
Charge press. hPa: 750
Del. quantity cm3/: 34,8...37,8
1000H.: (33,3...39,3)
7th speed 1/min: 600
Charge press. hPa: -
Del. quantity cm3/: -
1000H.: (23,3...27,7)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del. quantity cm3/: -
1000H.

Electr. shutoff:
Speed 1/min: 400
Del. quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 415
Del. quantity cm³/: -
1000H.: (4,0...12,0)
2nd speed 1/min: 1000
KSB solenoid-operated
valve volt: 1000
Del. quantity cm³/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 400
Charge press. hPa: 750
Del. quantity cm³/: -
ind. 1000H: 29,5
2nd speed 1/min: 500
Charge press. hPa: 750
Del. quantity cm³/: -
ax. 1000H: 37,5

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,7...6,0
MS	mm	:	1,2...1,4

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,3K1
Edition : 3.10.86
replaces : 9.85
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2075 R126-2
Type number : 0 460 494 155

Customer-specific information
Customer : PEUGEOT

Engine : XD3S

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 800
Setting value mm: 5,8...6,2

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 800
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 800

Del. quantity cm³/
1000H.: 53,5...54,5
Dispersion cm³/
1000H.: 2,5

Full-load del. w/out charge press.:

Speed 1/min: 500
Del. quantity cm³/
1000H.: 40,0...41,0

Low-idle speed regulation:

Speed 1/min: 350
Del. quantity cm³/
1000H.: 20,0...24,0
Dispersion cm³/
1000H.: 2,0

Full-load speed regulation:

Speed 1/min: 2300
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 26,5...32,5

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 67,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 800
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 1000
Charge press. hPa: 800
TD travel mm: 2,5...3,3
mm: (2,2...3,6)
3rd speed 1/min: 1500
TD travel mm: -
mm: (5,3...6,7)
4th speed 1/min: 2000
Charge press. hPa: 800
TD travel mm: 7,8...8,6
mm: (7,5...8,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Charge press. hPa: 800
Supply-pump
pressure bar: 1,4...2,0
2nd speed 1/min: 750

Charge press. hPa: 800
Supply-pump
pressure bar: 3,4...4,0
3rd speed 1/min: 2000
Charge press. hPa: 800
Supply-pump
pressure bar: 7,1...7,7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2075
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750
Charge-air pressure-setting
point hPa: 300
LDA stroke mm: 4,5
Del. quantity cm³/
1000H.: (47,5...48,5
(45,8...50,2)
2nd speed 1/min: 2600
Charge press. hPa: 800
Del. quantity cm³/
1000H.: 0...1,0
3rd speed 1/min: 2300
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (25,5...33,5)
4th speed 1/min: 2200
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (39,5...45,5
(38,5...46,5)
5th speed 1/min: 2000
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (52,0...54,0
(50,8...55,2)
6th speed 1/min: 1500
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (51,8...56,2)
7th speed 1/min: 1000
Charge press. hPa: 800
Del. quantity cm³/
1000H.: (50,5...53,5
(49,8...54,2)
8th speed 1/min: 750
Charge press. hPa: -
Del. quantity cm³/
1000H.: (41,5...44,5
(40,8...45,2)
9th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm³/
1000H.: (38,3...42,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm³/: -
1000H.

Electr. shutoff:
Speed 1/min: 400
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 350
Del. quantity cm³/: -
1000H.: (18,0..26,0)
2nd speed 1/min: 400
Del. quantity cm³/: 8,0...12,0
1000H.: (6,0...14,0)
3rd speed 1/min: 500
Del. quantity cm³/: -
1000H.: 0...1,0

Automatic starting fuel delivery:

1st speed 1/min: 230
Del. quantity cm³/: -
ind. 1000H: 60,0
2nd speed 1/min: 330
Del. quantity cm³/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: K1
KF	mm	: 5,4...5,7
MS	mm	: 1,2...1,4
SVS max.	mm	: 4,6
XK	mm	: 20,2...22,2
XL	mm	: 9,7...13,1

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0 K1
Edition : 02.04.87
replaces : 10.84
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2200 R153-1
Type number : 0 460 494 156

Customer-specific information
Customer : RENAULT

Engine : J 8 S-T01

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1400
Charge press. hPa: 800
Setting value bar: 5,1...5,7

Full-load del. with charge press.:

Speed 1/min: 1400
Charge press. hPa: 800

Del. quantity cm³/
1000H.: 48,2...49,2
Dispersion cm³/ : 2,5
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 600
Del. quantity cm³/
1000H.: 37,6...38,6

Low-idle speed regulation:

Speed 1/min: 350
Del. quantity cm³/
1000H.: 9,0...13,0
Dispersion cm³/ : 2,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 2400
Charge press. hPa: 800
Del. quantity cm³/
1000H: 23,0...29,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 800
TD travel mm: 1,9...2,7
mm: (1,6...3,0)

2nd speed 1/min: 1400
Charge press. hPa: 800
TD travel mm: -
mm: (3,5...4,9)

3rd speed 1/min: 1800
Charge press. hPa: 800
TD travel mm: 5,7...6,5
mm: (5,4...6,8)

4th speed 1/min: 2000
Charge press. hPa: 800
TD travel mm: 6,2...7,0
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Charge press. hPa: 800
Supply-pump
pressure bar: 2,6...3,2

2nd speed 1/min: 1800
Charge press. hPa: 800
Supply-pump
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 600
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2000
Charge press. hPa: 800
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 200
LDA stroke mm: 4,5
Del.quantity cm3/: 41,5...42,5
1000H.: (39,0...45,0)

2nd speed 1/min: 2700
Charge press. hPa: 800
Del.quantity cm3/: -
1000H.: 0...3,0

3rd speed 1/min: 2500
Charge press. hPa: 800
Del.quantity cm3/: -
1000H.: 0...17,5

4th speed 1/min: 2400
Charge press. hPa: 800
Del.quantity cm3/: -
1000H.: (22,0...30,0)

5th speed 1/min: 2000
Charge press. hPa: 800
Del.quantity cm3/: 44,5...46,5
1000H.: (43,2...47,8)

6th speed 1/min: 1400
Charge press. hPa: 800
Del.quantity cm3/: -
1000H.: (46,4...51,0)

7th speed 1/min: 1000
Charge press. hPa: 800
Del.quantity cm3/: 46,2...49,2
1000H.: (44,9...49,3)

8th speed 1/min: 600
Charge press. hPa: -
Del.quantity cm3/: -
1000H.: (35,1...41,1)

Zero delivery (stop):
1000H.

Electr. shutoff:
Speed 1/min: 350
ELAB volt: -
Del.quantity cm3/: 3
1000H.

Idle delivery:

1st speed 1/min: 350
Del.quantity cm3/: -
1000H.: (7,0...15,0)
2nd speed 1/min: 375
Del.quantity cm3/: 4,0...8,0
1000H.: (2,0...10,0)
3rd speed 1/min: 480
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 180
Del.quantity cm3/: -
ind. 1000H: 40,0

2nd speed 1/min: 300
Del.quantity cm3/: -
ax. 1000H: 40,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,4...1,6
SVS max.	mm	: 3,6
XK	mm	: 17,0...19,0
XL	mm	: 10,3...13,7

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,7 A
Edition : 10.12.86
replaces : 10.85
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2250 R187
Type number : 0 460 494 164

Customer-specific information
Customer : VW

Engine : 086-1,7LIT.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 4,8...5,4

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 34,5...35,5
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 450
Del.quantity cm3/
1000H.: 6,0...10,0
Dispersion cm3/: 2,0
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450
Del.quantity cm3/
1000H.: 12,0...18,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 35,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 2,1...2,9
mm: (1,8...3,2)
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,8...5,2)
3rd speed 1/min: 2250
TD travel mm: 7,4...8,2
mm: (7,1...8,5)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 2,3...3,3
2nd speed 1/min: 2250
Supply-pump
pressure bar: 6,5...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 55...70
quantity cm3/10s: (50...75)
2nd speed 1/min: 2250
Overflow : 82...112
quantity cm3/10s: (77...117)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2600
Del.quantity cm3/: -
1000H.: 0...6,0
3rd speed 1/min: 2450

Del.quantity cm3/: -
1000H.: (11,0...19,0)
4th speed 1/min: 2400
Del.quantity cm3/: 17,0...27,0
1000H.: (16,0...28,0)
5th speed 1/min: 2250
Del.quantity cm3/: 31,0...33,0
1000H.: (29,8...34,2)
6th speed 1/min: 1500
Del.quantity cm3/: -
1000H.: (32,8...37,2)
7th speed 1/min: 600
Del.quantity cm3/: 23,5...26,5
1000H.: (22,0...28,0)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:
Speed 1/min: 450
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 450
Del.quantity cm3/: -
1000H.: (4,0...12,0)
2nd speed 1/min: 1200
Del.quantity cm3/: -
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 360
Del.quantity cm3/: -
ind. 1000H: 35,0
2nd speed 1/min: 560
Del.quantity cm3/: -
ax. 1000H: 35,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,7...6,0
MS mm : 1,3...1,5
SVS max. mm : 4,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 1,6 A1
Edition : 3.10.86
replaces : -
Calibrating oil : ISO-4113

Injection pump : VE 4/9F1800 R125-1
Type number : D 460 494 168

Customer-specific information
Customer : FORD-KENT

Engine : 1,6L IDI IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 5,0...5,4
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,3...5,9
KSB solenoid-operated
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 1000

Del. quantity cm³/
1000H.: 27,0...28,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 440
Del. quantity cm³/
1000H.: 7,0...11,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/: 2,0
1000H.: -

Full-load speed regulation:

Speed 1/min: 1850
Del. quantity cm³/
1000H.: 20,0...26,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 50,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 1,6...2,4
mm: (1,3...2,7)

KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 1500
TD travel mm: -
mm: (4,5...5,9)

KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1750
TD travel mm: 6,3...7,1
mm: (6,0...7,4)

KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 600
TD travel mm: 2,2...4,2
mm: -

KSB solenoid-operated
valve volt: -

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 3,1...3,7

KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 1750
Supply-pump
pressure bar: 5,9...6,5
KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 600
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1750
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2050
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
1000H.: 0...2,0
2nd speed 1/min: 1910
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 7,5...15,5
1000H.: (7,5...15,5)

3rd speed 1/min: 1850
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
1000H.: (19,0...27,0)

4th speed 1/min: 1750
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 29,0...31,0
1000H.: (27,8...32,2)

5th speed 1/min: 1000
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
1000H.: (25,3...29,7)

6th speed 1/min: 600
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 24,0...27,0
1000H.: (22,5...28,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 1800
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 440
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
1000H.: (5,0...13,0)
2nd speed 1/min: 475
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 2,5...7,5
1000H.: (1,0...9,0)
3rd speed 1/min: 570
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
1000H.: 0...3,5

Automatic starting fuel delivery:

1st speed 1/min: 400
KSE solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 30,0
2nd speed 1/min: 500
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2-3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,6..1,85
SVS max.	mm	: 3,4
XK	mm	: 23,3...25,3
XL	mm	: 10,4...13,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 H3
Edition : 18.12.86
replaces : 4.86
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 R207
Type number : O 460 494 170

Customer-specific information
Customer : FIAT-RITMO

Engine : X8/34

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,1...4,5

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,3...5,9

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del. quantity cm³/
1000H.: 29,5...30,5
Dispersion cm³/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 390
Del.quantity cm3/
1000H.: 10,0...14,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450
Del.quantity cm3/
1000H.: 19,0...25,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 1,6...2,4
mm: (1,3...2,7)
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,6...5,0)
3rd speed 1/min: 2300
TD travel mm: 7,0...7,8
mm: (6,7...8,1)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump pressure bar: 3,1...3,7
2nd speed 1/min: 2300
Supply-pump pressure bar: 7,2...7,8

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow quantity cm3/10s: 41...83
cm3/10s: (26...98)
2nd speed 1/min: 2300
Overflow quantity cm3/10s: 55...138
cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2900

Del.quantity cm3/: -
1000H.: 0...1,5
3rd speed 1/min: 2650
Del.quantity cm3/: 2,0...9,0
1000H.: (1,5...9,5)
4th speed 1/min: 2450
Del.quantity cm3/: -
1000H.: (18,0...26,0)
5th speed 1/min: 2300
Del.quantity cm3/: 31,8...34,2
1000H.: (30,8...35,2)
6th speed 1/min: 1500
Del.quantity cm3/: -
1000H.: (27,8...32,2)
7th speed 1/min: 1000
Del.quantity cm3/: 29,8...32,2
1000H.: (28,7...33,3)
8th speed 1/min: 600
Del.quantity cm3/: 30,0...33,0
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 2300
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 390
Del.quantity cm3/: -
1000H.: (8,0...16,0)
2nd speed 1/min: 440
Del.quantity cm3/: 1,0...7,0
1000H.: (0...8,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm3/: -
ind. 1000H.: 48,0
2nd speed 1/min: 400
Del.quantity cm3/: -
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4

KF mm : 5,7...5,9
MS mm : 1,7...1,9
SVS max. mm : 2,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 X2
Edition : 02.04.87
replaces : 4.86
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2250 R211
Type number : 0 460 494 172

Customer-specific information
Customer : VW

Engine : 086-1,6LIT.LLK

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 000

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 750
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 750
Setting value bar: 4,9...5,5

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 750

Del. quantity cm³/
1000H.: 41,5...42,5
Dispersion cm³/ : 2,5
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del. quantity cm³/
1000H.: 34,3...37,3

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del. quantity cm³/
1000H.: 12,0...14,0
Dispersion cm³/ : 2,5
1000H.: -

Residual-Delivery Setting

Speed 1/min: 550
Del. quantity cm³/
1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2525
Charge press. hPa: 750
Del. quantity cm³/
1000H.: 13,0...19,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 35,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 750
TD travel mm: 1,8...2,6
mm: (1,5...2,9)
2nd speed 1/min: 1500
Charge press. hPa: 750
TD travel mm: -
mm: (3,3...4,3)
3rd speed 1/min: 1800
Charge press. hPa: 750
TD travel mm: 4,8...5,6
mm: (4,5...5,9)
4th speed 1/min: 2250
Charge press. hPa: 750
TD travel mm: 6,1...6,9
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 750
Supply-pump pressure bar: 2,0...2,6
2nd speed 1/min: 2250
Charge press. hPa: 750
Supply-pump pressure bar: 7,0...7,6

Overflow quantity at overflow valve:

1st speed 1/min: 600
Charge press. hPa: -
Overflow : 55...70
quantity cm³/10s: (50...75)
2nd speed 1/min: 2250
Charge press. hPa: 750
Overflow : 82...112
quantity cm³/10s: (77...117)

Delivery-quant. and breakaway char.:

1st speed 1/min: 900
Charge-air pressure-setting point hPa: 300
LDA stroke mm: 6,0
Del. quantity cm³/ : 32,5...33,5
1000H.: (30,0...36,0)
2nd speed 1/min: 2700
Charge press. hPa: 750
Del. quantity cm³/ : -
1000H.: 0...4,0
3rd speed 1/min: 2525
Charge press. hPa: 750
Del. quantity cm³/ : -
1000H.: (12,0...20,0)
4th speed 1/min: 2425
Charge press. hPa: 750
Del. quantity cm³/ : 25,0...35,0
1000H.: (24,0...36,0)
5th speed 1/min: 2250
Charge press. hPa: 750
Del. quantity cm³/ : 35,5...37,5
1000H.: (34,3...38,7)
6th speed 1/min: 1500
Charge press. hPa: -
Del. quantity cm³/ : -
1000H.: (33,6...38,0)
7th speed 1/min: 1500
Charge press. hPa: 750
Del. quantity cm³/ : -
1000H.: (39,8...44,2)
8th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm³/ : 23,5...24,5
1000H.: (21,0...27,0)
9th speed 1/min: 500
Charge press. hPa: 750
Del. quantity cm³/ : 31,0...34,0
1000H.: (19,5...35,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
 Del.quantity cm³/: -
 1000H.

Electr. shutoff:

Speed 1/min: 425
 Del.quantity cm³/: -
 1000H.

Idle delivery:

1st speed 1/min: 375
 Del.quantity cm³/: -
 1000H.: (7,5...18,5)
 2nd speed 1/min: 425
 Del.quantity cm³/: 5,0...9,0
 1000H.: (1,5...12,5)

High Idle:

Speed 1/min: 525
 Del.quantity cm³/: 7,0...9,0
 1000H.: (3,0...13,0)

Residual:

Speed 1/min: 500
 Del.quantity : 2,7...4,7
 1000H.: (0,2...7,2)

Automatic starting fuel delivery:

1st speed 1/min: 150
 Del.quantity cm³/: -
 ind. 1000H: 35,0

2nd speed 1/min: 350
 Del.quantity cm³/: -
 ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : K1
 KF mm : 5,7...6,0
 MS mm : 1,2...1,4
 SVS max. mm : 2,7

Setting of residual delivery.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F 2,5 M
Edition : 15.12.86
replaces : 6.86
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2100 R214
Type number : 0 460 494 173

Customer-specific information
Customer : S0FIM

Engine : 8144.67.2000

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02$ (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Setting value mm: 3,5...3,9

Supply-pump pressure:

Speed 1/min: 1100
Setting value bar: 4,7...5,3

Full-load del. w/out charge press.:

Speed 1/min : 1100

G05

Del.quantity cm3/
1000H.: 41,5...42,5
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 11,0...15,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2410
Del.quantity cm3/
1000H.: 19,0...25,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 60,0

Load-dependent start of delivery:

Speed 1/min: 1100

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 1100
TD travel mm: -
mm: (3,0...4,4)
3rd speed 1/min: 2000
TD travel mm: 8,6...9,4
mm: (8,3...9,7)

Supply-pump pressure characteristic:

1st speed 1/min: 700
Supply-pump
pressure bar: 3,5...4,1
2nd speed 1/min: 2000
Supply-pump
pressure bar: 7,0...7,6

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2100

Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2610
Del.quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 2510
Del.quantity cm3/: 6,5...13,5
1000H.: (6,0...14,0)
4th speed 1/min: 2410
Del.quantity cm3/: -
1000H.: (18,0...26,0)
5th speed 1/min: 2100
Del.quantity cm3/: 41,9...44,9
1000H.: (41,2...45,6)
6th speed 1/min: 2000
Del.quantity cm3/: 42,0...45,0
1000H.: (41,3...45,7)
7th speed 1/min: 1100
Del.quantity cm3/: -
1000H.: (39,8...44,2)
8th speed 1/min: 600
Del.quantity cm3/: 36,0...39,0
1000H.: (34,5...40,5)

Zero delivery (stop):

Mech. shutoff: -
Speed 1/min: -
Del.quantity cm3/: -
1000H.:

Electr. shutoff:
Speed 1/min: 2100
ELAB volt: -
Del.quantity cm3/: -
1000H.:

Idle delivery:

1st speed 1/min: 400
Del.quantity cm3/: -
1000H.: (9,0...17,0)
2nd speed 1/min: 450
Del.quantity cm3/: 2,0...8,0
1000H.: (1,0...9,0)
3rd speed 1/min: 700
Del.quantity cm3/: 1,5...7,5
1000H.: (0,5...8,5)
4th speed 1/min: 1000
Del.quantity cm3/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm3/: -
ind. 1000H: 55,0

2nd speed 1/min: 400
Del.quantity cm3/: -
ax. 1000H: 50,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,5
MS	mm	:	1,7...1,9
SVS max.	mm	:	4,3

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,5 D
Edition : 3.10.86
replaces : 9.85
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2125 R126-3
Type number : 0 460 494 178

Customer-specific information
Customer : PEUGEOT

Engine : XD 3T

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 800
Setting value mm: 5,8...6,2

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 800
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 800

Del. quantity cm3/
1000H.: 53,5...54,5
Dispersion cm3/ : 2,5
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm3/
1000H.: 40,0...41,00

Low-idle speed regulation:

Speed 1/min: 400
Del. quantity cm3/
1000H.: 17,0...21,0
Dispersion cm3/ : 2,0
1000H.: -

Full-load speed regulation:

Speed 1/min: 2350
Charge press. hPa: 800
Del. quantity cm3/
1000H.: 26,5...32,5

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 67,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 800
TD travel mm: 0,8...1,6
mm: (0,5...1,9)
2nd speed 1/min: 1000
Charge press. hPa: 800
TD travel mm: 2,5...3,3
mm: (2,2...3,6)
3rd speed 1/min: 1500
Charge press. hPa: 800
TD travel mm: -
mm: (5,3...6,7)
4th speed 1/min: 2000
Charge press. hPa: 800
TD travel mm: 7,8...8,6
mm: (7,5...8,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200
Charge press. hPa: 800
Supply-pump
pressure bar: 1,4...2,0

2nd speed 1/min: 750
Charge press. hPa: 800
Supply-pump
pressure bar: 3,4...4,0
3rd speed 1/min: 2000
Charge press. hPa: 800
Supply-pump
pressure bar: 7,1...7,7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2125
Charge press. hPa: -
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750
Charge-air pressure-setting
point hPa: 300
LDA stroke mm: 4,5
Del. quantity cm3/ : 47,5...48,5
1000H.: (45,8...50,2)
2nd speed 1/min: 2650
Charge press. hPa: 800
Del. quantity cm3/ : -
1000H.: 0...1,0
3rd speed 1/min: 2350
Charge press. hPa: 800
Del. quantity cm3/ : 26,5...32,5
1000H.: (25,5...33,5)
4th speed 1/min: 2250
Charge press. hPa: 800
Del. quantity cm3/ : 38,5...44,5
1000H.: (37,5...45,5)
5th speed 1/min: 2000
Charge press. hPa: 800
Del. quantity cm3/ : 52,0...54,0
1000H.: (50,8...55,2)
6th speed 1/min: 1500
Charge press. hPa: 800
Del. quantity cm3/ : -
1000H.: (51,8...56,2)
7th speed 1/min: 1000
Charge press. hPa: 800
Del. quantity cm3/ : 50,5...53,5
1000H.: (49,8...54,2)
8th speed 1/min: 750
Charge press. hPa: -
Del. quantity cm3/ : 41,5...44,5
1000H.: (40,8...45,2)
9th speed 1/min: 500
Charge press. hPa: -
Del. quantity cm3/ : -
1000H.: (38,3...42,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2125
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 400
Del. quantity cm³/: -
1000H.: (15,0...23,0
2nd speed 1/min: 450
Del. quantity cm³/: 5,0...9,0
1000H.: (3,0...11,0)
3rd speed 1/min: 550
Del. quantity cm³/: -
1000H.: 0...3,5

Automatic starting fuel delivery:

1st speed 1/min: 230
Del. quantity cm³/: -
ind. 1000H: 60,0
2nd speed 1/min: 330
Del. quantity cm³/: -
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	n.n	: K1
KF	mm	: 5,2...5,4
MS	mm	: 1,2...1,4
SVS max.	mm	: 5,5
XK	mm	: 20,2...22,2
XL	mm	: 9,4...12,8

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWW1,6 W17
Edition : 8.12.86
replaces : 12.85
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2400 R221
Type number : 0 460 494 179

Customer-specific information
Customer : VW

Engine : 086-1,6 LIT.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 31,5...32,5
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 12,0...14,0
Dispersion cm3/: 2,0
1000H.: (3,0)
Residual-Delivery Setting
Speed 1/min: 550
Del.quantity cm3/
1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2600
Del.quantity cm3/
1000H.: 11,0...17,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 35,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 1250
TD travel mm: -
mm: (1,6...3,0)
3rd speed 1/min: 1800
TD travel mm: 4,2...5,0
mm: (3,9...5,3)
4th speed 1/min: 2400
TD travel mm: 6,1...6,9
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 2,1...2,7
2nd speed 1/min: 2400
Supply-pump
pressure bar: 7,3...7,9

Overflow quantity at overflow valve:

1st speed 1/min: 600

Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2400
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2800
Del. quantity cm3/: -
1000H.: 0...4,0
3rd speed 1/min: 2600
Del. quantity cm3/: -
1000H.: (10,0...18,0)
4th speed 1/min: 2500
Del. quantity cm3/: 19,0...29,0
1000H.: (20,0...28,0)
5th speed 1/min: 2400
Del. quantity cm3/: 26,7...28,7
1000H.: (25,5...30,1)
6th speed 1/min: 1500
Del. quantity cm3/: -
1000H.: (29,7...34,3)
7th speed 1/min: 600
Del. quantity cm3/: 20,2...23,2
1000H.: (18,7...24,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm3/: -
1000H.:

Electr. shutoff:

Speed 1/min: 400
Del. quantity cm3/: -
1000H.:

Idle delivery:

1st speed 1/min: 375
Del. quantity cm3/: -
1000H.: (9,0...17,0)
2nd speed 1/min: 425
Del. quantity cm3/: 5,5...8,5
1000H.: (3,0...11,0)

High Idle:

Speed 1/min: 525
Del. quantity cm3/: 7,0...9,0
1000H.: -

Residual:

Speed 1/min: 500
Del. quantity : 2,5...4,5
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200

Del. quantity cr3/: -
ind. 1000H: 35,0

2nd speed 1/min: 350
Del. quantity cm3/: -
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,3...1,5
XK	mm	: 17,0...19,0
XL	mm	: 9,8...13,2

Setting of residual delivery.
emarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 W15
Edition : 8.12.86
replaces : 12.85
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2400 R224
Type number : 0 460 494 185

Customer-specific information
Customer : VW

Engine : 086-1,6 LIT.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 31,5...32,5
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 12,0...14,0
Dispersion cm3/: 2,0
1000H.: (3,0)
Residual-Delivery Setting
Speed 1/min: 550
Del.quantity cm3/
1000H.: 2,5...3,5
Full-load speed regulation:

Speed 1/min: 2600
Del.quantity cm3/
1000H.: 11,0...17,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 35,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 1250
TD travel mm: -
mm: (1,6...3,0)
3rd speed 1/min: 1800
TD travel mm: 4,2...5,0
mm: (3,9...5,3)
4th speed 1/min: 2400
TD travel mm: 6,1...6,9
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 2,1...2,7
2nd speed 1/min: 2400
Supply-pump
pressure bar: 7,3...7,9

Overflow quantity at overflow valve:

1st speed 1/min: 600

Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2400
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2800
Del. quantity cm3/: -
1000H.: 0...4,0
3rd speed 1/min: 2600
Del. quantity cm3/: -
1000H.: (10,0...18,0)
4th speed 1/min: 2500
Del. quantity cm3/: 19,0...29,0
1000H.: (20,0...28,0)
5th speed 1/min: 2400
Del. quantity cm3/: 26,7...28,7
1000H.: (25,5...30,1)
6th speed 1/min: 1500
Del. quantity cm3/: -
1000H.: (29,7...34,3)
7th speed 1/min: 600
Del. quantity cm3/: 20,2...23,2
1000H.: (19,4...24,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 400
Del. quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del. quantity cm3/: -
1000H.: (9,0...17,0)
2nd speed 1/min: 425
Del. quantity cm3/: 5,5...8,5
1000H.: (3,0...11,0)

High Idle:

Speed 1/min: 525
Del. quantity cm3/: 7,0...9,0
1000H.: -

Residual:

Speed 1/min: 500
Del. quantity : 2,5...4,5
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200

Del. quantity cm3/: -
ind. 1000H: 35,0

2nd speed 1/min: 350
Del. quantity cm3/: -
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,3...1,5
SVS max.	mm	: 3,2
XK	mm	: 17,0...19,0
XL	mm	: 9,8...13,2

Setting of residual delivery.
emarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 1,6 A2
Edition : 3.10.86
replaces : -
Calibrating oil : ISO-4113
Injection pump : VE 4/9F2400 R125-2
Type number : 0 460 494 186

Customer-specific information
Customer : FORD-KENT

Engine : 1,6L. IDI IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,3...4,7
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,3...5,9
KSB solenoid-operated
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 1750

G14

Del.quantity cm³/
1000H.: 29,5...30,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/: 2,5
1000H.: -

Low-idle speed regulation:

Speed 1/min: 440
Del.quantity cm³/
1000H.: 7,0...11,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/: 2,0
1000H.: -

Full-load speed regulation:

Speed 1/min: 2675
Del.quantity cm³/
1000H.: 7,5...13,5
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm³/1000H.: 50,0
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 1,3...2,1
KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,8...5,2)
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 2000
TD travel mm: 6,8...7,6
mm: (6,5...7,9)
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 600
TD travel mm: 2,2...4,2
mm: -
KSB solenoid-operated
valve volt: -

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 3,0...3,6
KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 2000
Supply-pump
pressure bar: 6,6...7,2
KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 600
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...8,3
quantity cm³/10s: (26...98)
2nd speed 1/min: 2400
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2950
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
1000H.: 0...2,0
2nd speed 1/min: 2675
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
1000H.: (6,5...14,5)
3rd speed 1/min: 2550
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 18,5...26,5
1000H.: (18,5...26,5)
4th speed 1/min: 2400
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 28,1...30,1
1000H.: (26,9...31,3)
5th speed 1/min: 1750
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
1000H.: (27,8...32,2)
6th speed 1/min: 1000
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 26,0...29,0
1000H.: (25,3...29,7)
7th speed 1/min: 600
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 24,0...27,0
1000H.: (22,5...28,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 2400
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 440
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
1000H.: (5,0...13,0)
2nd speed 1/min: 475
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 2,5...7,5
1000H.: (1,0...9,0)
3rd speed 1/min: 570
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
1000H.: 0...3,5

Arrangement of drivers on engine-
speed lever for exhaust-gas-
recirculation valve linkage (guage)

1st speed 1/min: 1100
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: 12,0...13,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 400
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
ind. 1000H: 30,0

2nd speed 1/min: 500
KSB solenoid-operated
valve volt: 12,0
Del. quantity cm³/: -
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2-3,4

KF mm : 5,7-6,0
MS mm : 1,6-1,85

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 P
Edition : 18.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : Ve 4/9F2100 R234
Type number : 0 460 494 187

Customer-specific information
Customer : FIAT REGATA

Engine : X8/45

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000

Del. quantity cm³/
1000H.: 47,5...48,5
Dispersion cm³/ : 2,5
1000H : (3,0)

Full-load del. w/out charge press.:

Speed 1/min : 800
Del. quantity cm³/
1000H.: 34,8...35,8

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm³/
1000H.: 16,0...20,0
Dispersion cm³/ : 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 15,0...21,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 57,0

Load-dependent start of delivery:

Speed 1/min: 1500
Charge press. hPa: -

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
Charge press. hPa: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: -
mm: (4,4...5,8)
3rd speed 1/min: 2000
Charge press. hPa: 1000
TD travel mm: 7,4...8,2
mm: (7,1...8,5)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Charge press. hPa: 1000

Supply-pump
 pressure bar: 2,2...2,8
 2nd speed 1/min: 800
 Charge press. hPa: 1000
 Supply-pump
 pressure bar: 3,5...4,1
 3rd speed 1/min: 2000
 Charge press. hPa: 1000
 Supply-pump
 pressure bar: 7,0...7,6

Overflow quantity at overflow valve:

1st speed 1/min: 600
 Charge press. hPa: -
 Overflow : 41...83
 quantity cm3/10s: (26...98)
 2nd speed 1/min: 2100
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800
 Charge-air pressure-setting
 point hPa: 300
 Del. quantity cm3/: 39,5...40,5
 1000H.: (37,8...40,2)
 2nd speed 1/min: 2550
 Charge press. hPa: 1000
 Del. quantity cm3/: -
 1000H.: 0...7,0
 3rd speed 1/min: 2400
 Charge press. hPa: 1000
 Del. quantity cm3/: -
 1000H.: (14,0...22,0)
 4th speed 1/min: 2300
 Charge press. hPa: 1000
 Del. quantity cm3/: 25,5...32,5
 1000H.: (25,0...33,0)
 5th speed 1/min: 2100
 Charge press. hPa: 1000
 Del. quantity cm3/: 46,5...49,5
 1000H.: (45,8...50,2)
 6th speed 1/min: 1500
 Charge press. hPa: 1000
 Del. quantity cm3/: -
 1000H.: (45,8...50,2)
 7th speed 1/min: 800
 Charge press. hPa: 1000
 Del. quantity cm3/: 49,5...52,5
 1000H.: (48,8...53,2)
 8th speed 1/min: 800
 Charge press. hPa: -
 Del. quantity cm3/: -
 1000H.: (33,1...37,5)
 9th speed 1/min: 600
 Charge press. hPa: -
 Del. quantity cm3/: 34,6...37,0
 1000H.: (32,8...38,8)

Zero delivery (stop):

Mech. shutoff:
 Speed 1/min: 2100
 Del. quantity cm3/: -
 1000H.

Idle delivery:

1st speed 1/min: 350
 Del. quantity cm3/: -
 1000H.: (14,0...22,0)
 2nd speed 1/min: 400
 Del. quantity cm3/: 4,5...10,5
 1000H.: (3,5...11,5)
 3rd speed 1/min: 500
 Del. quantity cm3/: -
 1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 300
 Del. quantity cm3/: -
 ind. 1000H: 55,0
 2nd speed 1/min: 500
 Del. quantity cm3/: -
 ax. 1000H: 40,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,4...1,65
SVS max.	mm	: -
XK	mm	: 17,0...19,0
XL	mm	: 10,6...14,0

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,9 F
Edition : 16.12.86
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/9F2300 R237
Type number : 0 460 494 188

Customer-specific information
Customer : PEUGEOT

Engine : XUD 9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 3,2...3,6

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

Speed 1/min : 1250
Del. quantity cm3/
1000H.: 30,0...31,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 375
Del. quantity cm3/
1000H.: 8,5...10,5
Dispersion cm3/: 2,0
1000H.: (3,0)
Residual-Delivery Setting
Speed 1/min: 550
Del. quantity cm3/
1000H.: 2,5...3,5
Full-load speed regulation:

Speed 1/min: 2400
Del. quantity cm3/
1000H.: 20,0...26,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 44,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
TD travel mm: 0,9...1,7
mm: (0,6...2,0)
2nd speed 1/min: 1250
TD travel mm: -
mm: (2,7...4,1)
3rd speed 1/min: 2000
TD travel mm: 6,4...7,2
mm: (6,1...7,5)

Supply-pump pressure characteristic:

1st speed 1/min: 700
Supply-pump
pressure bar: 2,5...3,1
2nd speed 1/min: 2000
Supply-pump
pressure bar: 5,7...6,3

Overflow quantity at overflow valve:

1st speed 1/min: 700
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2300

Overflow : 55..138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650

Del.quantity cm3/: -
1000H.: 0...7,0

3rd speed 1/min: 2500

Del.quantity cm3/: 10,0...16,0
1000H.: (9,0...17,0)

4th speed 1/min: 2400

Del.quantity cm3/: -
1000H.: (19,0...27,0)

5th speed 1/min: 2250

Del.quantity cm3/: 30,5...32,5
1000H.: (29,3...33,7)

6th speed 1/min: 2000

Del.quantity cm3/: 32,0...34,0
1000H.: (30,8...35,2)

7th speed 1/min: 1250

Del.quantity cm3/: -
1000H.: (28,3...32,7)

8th speed 1/min: 700

Del.quantity cm3/: 30,0...33,0
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2300

Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 375

Del.quantity cm3/: -
1000H.: (5,5...13,5)

High Idle:

Speed 1/min: 470

Del.quantity cm3/: 8,0...10,0
1000H.: (5,0...13,0)

Residual:

Speed 1/min: 550

Del.quantity : -
1000H.: 0...7,0

Arrangement of drivers on engine-
speed lever for exhaust-gas-
recirculation valve linkage (guage)

1st speed 1/min: 1125

Del.quantity cm3/: 18,0...20,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200

Del.quantity cm3/: -
ind. 1000H: 40,0

2nd speed 1/min: 300

Del.quantity cm3/: -
ax. 1000H: 35,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4

KF mm : 5,7...6,0

MS mm : 1,3...1,55

SVS max. mm : -

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F 2,5 N
Edition : 19.12.86
replaces : 4.86
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2100 R22-7
Type number : 0 460 494 189

Customer-specific information
Customer : S0FIM

Engine : 8144.67.220

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +-0,02 (0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1800
Setting value mm: 7,6...8,0

Supply-pump pressure:

Speed 1/min: 1800
Setting value bar: 6,3...6,9

Full-load del. w/out charge press.:

Speed 1/min : 1000

Del. quantity cm³/ 1000H.: 36,9...37,9
Dispersion cm³/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 370
Del. quantity cm³/ 1000H.: 8,0...12,0
Dispersion cm³/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2350
Del. quantity cm³/ 1000H.: 18,5...24,5

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 55,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
TD travel mm: 0,9...1,7
mm: (0,6...2,0)
2nd speed 1/min: 1800
TD travel mm: -
mm: (7,1...8,5)
3rd speed 1/min: 2000
TD travel mm: 8,3...9,1
mm: (8,0...9,4)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump pressure bar: 3,2...3,8
2nd speed 1/min: 2000
Supply-pump pressure bar: 6,7...6,3

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow quantity cm³/10s: 41...83
cm³/10s: (26...98)
2nd speed 1/min: 2100
Overflow quantity cm³/10s: 55...138
cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2500

Del. quantity cm³/: -
1000H.: 0...4,5
3rd speed 1/min: 2350
Del. quantity cm³/: -
1000H.: (17,5...25,5)
4th speed 1/min: 2100
Del. quantity cm³/: 36,1...38,7
1000H.: (35,1...39,7)
5th speed 1/min: 1000
Del. quantity cm³/: -
1000H.: (35,1...39,7)
6th speed 1/min: 1100
Del. quantity cm³/: 42,5...45,5
1000H.: (41,7...46,3)
7th speed 1/min: 600
Del. quantity cm³/: 34,3...37,3
1000H.: (32,8...38,8)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 2100
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 370
Del. quantity cm³/: -
1000H.: (6,0...14,0)
2nd speed 1/min: 420
Del. quantity cm³/: -
1000H.: 0...1,5
3rd speed 1/min: 500
Del. quantity cm³/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 400
Del. quantity cm³/: -
ind. 1000H.: 37,0
2nd speed 1/min: 480
Timing valve volt: -
Del. quantity cm³/: 32,0...38,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,4...5,7
MS mm : 1,7...1,9

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 P1
Edition : 18.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2400 R242
Type number : O 460 494 193

Customer-specific information
Customer : FIAT

Engine : X8/57

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1500
Charge press. hPa: 1000
Setting value bar: 5,5...6,1

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 1000

Del. quantity cm³/
1000H.: 35,5...36,5
Dispersion cm³/ : 3,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 750
Del. quantity cm³/
1000H.: 25,3...26,3

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del. quantity cm³/
1000H.: 12,0...18,0
Dispersion cm³/ : 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2650
Charge press. hPa: 1000
Del. quantity cm³/
1000H: 17,0...23,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 48,0

Load-dependent start of delivery:

Speed 1/min: 1500
Charge press. hPa: -

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1,3...2,1
mm: (1,0...2,4)
2nd speed 1/min: 1500
Charge press. hPa: 1000
TD travel mm: -
mm: (4,4...5,8)
3rd speed 1/min: 2400
Charge press. hPa: 1000
TD travel mm: 8,5...9,3
mm: (8,2...9,6)

Supply-pump pressure characteristic:

1st speed 1/min: 750
Charge press. hPa: 1000

Supply-pump
pressure bar: 3,6...4,2
2nd speed 1/min: 1500
Charge press. hPa: 1000
Supply-pump
pressure bar: 5,5...6,1
4th speed 1/min: 2400
Charge press. hPa: 1000
Supply-pump
pressure bar: 7,6...8,2

Overflow quantity at overflow valve:

1st speed 1/min: 750
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2400
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1100
Charge-air pressure-setting
point hPa: 400
Del. quantity cm³/ : 29,5...30,5
1000H.: (27,8...32,2)
2nd speed 1/min: 2850
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: 0...6,0
3rd speed 1/min: 2650
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: (16,0...24,0)
5th speed 1/min: 2400
Charge press. hPa: 1000
Del. quantity cm³/ : 35,0...38,0
1000H.: (32,5...40,5)
6th speed 1/min: 1500
Charge press. hPa: 1000
Del. quantity cm³/ : -
1000H.: (33,8...38,2)
7th speed 1/min: 1100
Charge press. hPa: -
Del. quantity cm³/ : 24,3...26,7
1000H.: (23,3...27,7)
8th speed 1/min: 750
Charge press. hPa: -
Del. quantity cm³/ : -
1000H.: (22,8...28,8)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 2400
Del. quantity cm³/ : -
1000H.

Idle delivery:

1st speed 1/min: 350
Del. quantity cm³/: -
1000H.: (11,0...19,0)
2nd speed 1/min: 400
Del. quantity cm³/: 4,0...8,0
1000H.: (2,0...10,0)
3rd speed 1/min: 520
Del. quantity cm³/: -
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 250
Del. quantity cm³/: -
ind. 1000H: 40,0
2nd speed 1/min: 350
Del. quantity cm³/: -
ax. 1000H: 34,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,4...1,65
SVS max.	mm	: -
XK	mm	: 17,0...19,0
XL	mm	: 9,1...12,5

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,9 D
Edition : 02.04.87
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/9F2300 R162-1
Type number : 0 460 494 195

Customer-specific information
Customer : PEUGEOT

Engine : XUD9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C /
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 3,2...3,6

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

Speed 1/min : 1250
Del.quantity cm3/
1000H.: 29,5...30,5
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,5...10,5
Dispersion cm3/: 2,0
1000H.: (3,0)
Residual-Delivery Setting
Speed 1/min: 550
Del.quantity cm3/
1000H.: 2,5...3,5
Full-load speed regulation:

Speed 1/min: 2400
Del.quantity cm3/
1000H: 20,0...26,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 44,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,7...1,5
mm: (0,4...1,8)
2nd speed 1/min: 1250
TD travel mm: -
mm: (2,7...4,1)
3rd speed 1/min: 2000
TD travel mm: 7,5...8,3
mm: (7,2...8,6)

Supply-pump pressure characteristic:

1st speed 1/min: 800
Supply-pump
pressure bar: 2,6...3,2
2nd speed 1/min: 2000
Supply-pump
pressure bar: 5,9...6,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2300

Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650

Del. quantity cm3/: -
1000H.: 0...7,0

3rd speed 1/min: 2500

Del. quantity cm3/: 11,5...17,5
1000H.: (10,5...18,5)

4th speed 1/min: 2400

Del. quantity cm3/: -
1000H.: (19,0...27,0)

5th speed 1/min: 2250

Del. quantity cm3/: 31,0...33,0
1000H.: (29,8...34,2)

6th speed 1/min: 2000

Del. quantity cm3/: 31,5...33,5
1000H.: (30,3...34,7)

7th speed 1/min: 1250

Del. quantity cm3/: -
1000H.: (27,8...32,2)

8th speed 1/min: 800

Del. quantity cm3/: 30,5...33,5
1000H.: (29,0...35,0)

9th speed 1/min: 500

Del. quantity cm3/: 29,5...32,5
1000H.: (28,0...34,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -

Del. quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 2300

ELAB volt: -

Del. quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 375

Del. quantity cm3/: -
1000H.: (5,5...13,5)

High Idle:

Speed 1/min: 470

Del. quantity cm3/: 8,0...10,0
1000H.: (5,0...13,0)

Residual:

Speed 1/min: 550

Del. quantity : -
1000H.: 0...7,0

Automatic starting fuel delivery:

1st speed 1/min: 200

Del. quantity cm3/: -
ind. 1000H: 40,0

2nd speed 1/min: 300

Del. quantity cm3/: -
ax. 1000H: 35,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4

KF mm : 5,7...6,0

MS mm : 1,4...1,55

SVS max. mm : 3,0

XK mm : 17,0...19,0

XL mm : 11,5...14,9

Setting of residual delivery.

Idle setting (LFG) according to
VDT-I-460/135.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,3 B
Edition : 18.12.86
replaces : 4.86
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 R207-1
Type number : 0 460 494 196

Customer-specific information
Customer : FIAT-RITMO

Engine : X8/34

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,1...4,5

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,3...5,9

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 29,5...30,5
Dispersion cm3/: 2,5
1000H.: (3,0)

H01

Low-idle speed regulation:

Speed 1/min: 390
Del.quantity cm3/
1000H.: 10,0...14,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450
Del.quantity cm3/
1000H.: 19,0...25,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 1,6...2,4
mm: (1,3...2,7)
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,6...5,0)
3rd speed 1/min: 2300
TD travel mm: 7,0...7,8
mm: (6,7...8,1)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump
pressure bar: 3,1...3,7
2nd speed 1/min: 2300
Supply-pump
pressure bar: 7,2...7,8

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2300
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:
1st speed 1/min: -

Del. quantity cm³/: -
1000H.: -
2nd speed 1/min: 2900
Del. quantity cm³/: -
1000H.: 0...1,5
3rd speed 1/min: 2650
Del. quantity cm³/: 2,0...9,0
1000H.: (1,5...9,5)
4th speed 1/min: 2450
Del. quantity cm³/: -
1000H.: (18,0...26,0)
5th speed 1/min: 2300
Del. quantity cm³/: 31,8...34,2
1000H.: (30,8...35,2)
6th speed 1/min: 1500
Del. quantity cm³/: -
1000H.: (27,8...32,2)
7th speed 1/min: 1000
Del. quantity cm³/: 29,8...32,2
1000H.: (28,7...33,3)
8th speed 1/min: 600
Del. quantity cm³/: 30,0...33,0
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 2300
Del. quantity cm³/: -
1000H.: -

Idle delivery:

1st speed 1/min: 390
Del. quantity cm³/: -
1000H.: (8,0...16,0)
2nd speed 1/min: 440
Del. quantity cm³/: 1,0...7,0
1000H.: (0...8,0)
3rd speed 1/min: 500
Del. quantity cm³/: -
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 300
Del. quantity cm³/: -
ind. 1000H.: 48,0
2nd speed 1/min: 400
Del. quantity cm³/: -
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

H02

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...5,9
MS	mm	: 1,7...1,9
SVS max.	mm	: 2,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 2,3 M
Edition : 12.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2200 L243
Type number : O 460 494 197

Customer-specific information
Customer : OPEL

Engine : 2,3 LIT.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1200
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 1200
Del. quantity cm3/
1000H.: 43,0...44,0
Dispersion cm3/: 3,0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 270
Del.quantity cm3/
1000H.: 10,0...14,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450
Del.quantity cm3/
1000H.: 21,0...27,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 52,0

Load-dependent start of delivery:

Speed 1/min: 1200

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
2nd speed 1/min: 800
TD travel mm: 1,9...2,7
mm: (1,6...3,0)
3rd speed 1/min: 1200
TD travel mm: -
mm: (3,8...4,2)
4th speed 1/min: 2200
TD travel mm: 9,7...10,5
mm: (9,4...10,8)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump pressure bar: 2,4...3,0
2nd speed 1/min: 800
Supply-pump pressure bar: 3,0...3,6
3rd speed 1/min: 2200
Supply-pump pressure bar: 6,5...7,1

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm3/10s: (26...98)

2nd speed 1/min: 2200
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2700
Del.quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 2600
Del.quantity cm3/: 4,0...12,0
1000H.: (4,0...12,0)
4th speed 1/min: 2450
Del.quantity cm3/: -
1000H.: (20,0...28,0)
5th speed 1/min: 2200
Del.quantity cm3/: 34,8...37,8
1000H.: (34,0...38,6)
6th speed 1/min: 1200
Del.quantity cm3/: -
1000H.: (41,2...45,8)
7th speed 1/min: 600
Del.quantity cm3/: 33,5...36,5
1000H.: (32,0...38,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 2200
ELAB volt: -
Del.quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 270
Del.quantity cm3/: -
1000H.: (8,0...16,0)
2nd speed 1/min: 320
Del.quantity cm3/: 3,0...9,0
1000H.: (2,0...10,0)
3rd speed 1/min: 400
Del.quantity cm3/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H.: 52,0

2nd speed 1/min: 230
Del.quantity cm3/: -
ax. 1000H.: 35,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,8...2,05
SVS max.	mm	: -
XK	mm	: 17,0...19,0
XL	mm	: 9,7...13,4

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0F1
Edition : 02.04.87
replaces :
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2250 R158-1
Type number : O 460 494 198

Customer-specific information
Customer : RENAULT

Engine : J8S-A01

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400
Setting value mm: 4,4...4,8

Supply-pump pressure:

Speed 1/min: 1400
Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

Speed 1/min : 1400
Del. quantity cm³/
1000H.: 35,0...36,0
Dispersion cm³/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm3/
1000H.: 7,0...11,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400
Del.quantity cm3/
1000H.: 17,0...23,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 52,0

Load-dependent start of delivery:

Speed 1/min: 1400

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 2,6...3,4
mm: (1,3...3,7)
2nd speed 1/min: 1400
TD travel mm: -
mm: (3,9...5,3)
3rd speed 1/min: 2000
TD travel mm: 6,7...7,5
mm: (6,4...7,8)

Supply-pump pressure characteristic:

1st speed 1/min: 1000
Supply-pump pressure bar: 3,9...4,5
2nd speed 1/min: 2000
Supply-pump pressure bar: 6,5...7,1

Overflow quantity at overflow valve:

1st speed 1/min: 1000
Overflow quantity cm3/10s: 55...138
(40...153)
2nd speed 1/min: 2200
Overflow quantity cm3/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2550

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Del.quantity cm3/: -
1000H.: 0...5,0
3rd speed 1/min: 2400
Del.quantity cm3/: -
1000H.: (16,0...24,0)
4th speed 1/min: 2200
Del.quantity cm3/: 37,0...39,0
1000H.: (35,7...40,3)
5th speed 1/min: 2100
Del.quantity cm3/: 37,5...39,5
1000H.: (36,2...40,8)
6th speed 1/min: 1400
Del.quantity cm3/: -
1000H.: (33,2...37,8)
7th speed 1/min: 1000
Del.quantity cm3/: 34,0...37,0
1000H.: (33,2...37,8)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del.quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm3/: 3
1000H.

Idle delivery:

1st speed 1/min: 425
Del.quantity cm3/: -
1000H.: (5,0...13,0)
2nd speed 1/min: 650
Del.quantity cm3/: -
1000H.: 0...5,0

Automatic starting fuel delivery:

1st speed 1/min: 370
Del.quantity cm3/: -
ind. 1000H.: 45,0
2nd speed 1/min: 480
Del.quantity cm3/: -
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4

KF	mm	: 5,7...5,9
MS	mm	: 1,4...1,6
SVS max.	mm	: 3,6
XK	mm	: 18,8...20,8
XL	mm	: 9,4...12,8

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 2,3 M1
Edition : 12.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2200 L243-2
Type number : 0 460 494 203

Customer-specific information
Customer : OPEL

Engine : 2,3 LIT.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1200
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 1200
Del.quantity cm3/
1000H.: 43,0...44,0
Dispersion cm3/: 3,0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 270
Del. quantity cm³/
1000H.: 10,0...14,0
Dispersion cm³/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450
Del. quantity cm³/
1000H.: 21,0...27,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm³/1000H.: 52,0

Load-dependent start of delivery:

Speed 1/min: 1200

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
2nd speed 1/min: 800
TD travel mm: 1,9...2,7
mm: (1,6...3,0)
3rd speed 1/min: 1200
TD travel mm: -
mm: (3,8...4,2)
4th speed 1/min: 2200
TD travel mm: 9,7...10,5
mm: (9,4...10,8)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump pressure bar: 2,4...3,0
2nd speed 1/min: 800
Supply-pump pressure bar: 3,0...3,6
3rd speed 1/min: 2200
Supply-pump pressure bar: 6,5...7,1

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm³/10s: (26...98)

2nd speed 1/min: 2200
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2700
Del. quantity cm³/
1000H.: 0...3,0
3rd speed 1/min: 2600
Del. quantity cm³/
1000H.: (4,0...12,0)
4th speed 1/min: 2450
Del. quantity cm³/
1000H.: (20,0...28,0)
5th speed 1/min: 2200
Del. quantity cm³/
1000H.: (34,8...37,8)
6th speed 1/min: 1200
Del. quantity cm³/
1000H.: (41,2...45,8)
7th speed 1/min: 600
Del. quantity cm³/
1000H.: (33,5...36,5)
1000H.: (32,0...38,0)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: -
Del. quantity cm³/
1000H.:

Electr. shutoff:
Speed 1/min: 2200
ELAB volt: -
Del. quantity cm³/
1000H.:

Idle delivery:

1st speed 1/min: 270
Del. quantity cm³/
1000H.: (8,0...16,0)
2nd speed 1/min: 320
Del. quantity cm³/
1000H.: (2,0...10,0)
3rd speed 1/min: 400
Del. quantity cm³/
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 130
Del. quantity cm³/
ind. 1000H.: 52,0
2nd speed 1/min: 230
Del. quantity cm³/
ax. 1000H.: 35,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0
XK mm : 18,7...20,7
XL mm : 9,3...12,7

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 P2
Edition : 18.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 R256
Type number : 0 460 494 204

Customer-specific information
Customer : FIAT UNO

Engine : X8/34

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,3...5,9

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 29,5...30,5
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 390
Del.quantity cm3/
1000H.: 10,0...14,0
Dispersion cm3/: 2,0
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2300
Del.quantity cm3/
1000H.: 31,8...34,2

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 1,2...2,0
mm: (0,9...2,3)
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,8...5,2)
3rd speed 1/min: 2300
TD travel mm: 7,4...8,2
mm: (7,1...8,5)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump pressure bar: 3,1...3,7
2nd speed 1/min: 2300
Supply-pump pressure bar: 7,1...7,7

Overflow quantity at overflow valve:

1st speed 1/min: 2300
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2900
Del.quantity cm3/: -
1000H.: 0...1,5
3rd speed 1/min: 2650

Del.quantity cm3/: 1,5...8,5
1000H.: (1,0...9,0)
4th speed 1/min: 2450
Del.quantity cm3/: 19,0...25,0
1000H.: (18,0...26,0)
5th speed 1/min: 2300
Del.quantity cm3/: -
1000H.: (30,8...35,2)
6th speed 1/min: 1500
Del.quantity cm3/: -
1000H.: (27,8...32,2)
7th speed 1/min: 1000
Del.quantity cm3/: 28,8...31,2
1000H.: (27,8...32,2)
8th speed 1/min: 600
Del.quantity cm3/: 30,0...33,0
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 2300
Del.quantity cm3/: -
1000H.:

Idle delivery:

1st speed 1/min: 390
Del.quantity cm3/: -
1000H.: (8,0...16,0)
2nd speed 1/min: 440
Del.quantity cm3/: 0...6,0
1000H.: (0...7,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm3/: -
ind. 1000H.: 48,0
2nd speed 1/min: 400
Del.quantity cm3/: -
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,7...6,0
MS mm : 1,7...1,95
SVS max. mm : -

XK	mm	:	17,0...19,0
XL	mm	:	9,8...13,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 W19
Edition : 02.04.87
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2400 R221-2
Type number : 0 460 494 207

Customer-specific information
Customer : VW

Engine : 086-1,6L

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 1000
Del.quantity cm3/
1000H.: 28,5...29,5

Low-idle speed regulation:

Speed 1/min: 375
Del. quantity cm3/
1000H.: 12,0...14,0

Residual-Delivery Setting

Speed 1/min: 550
Del. quantity cm3/
1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2600
Del. quantity cm3/
1000H.: 11,0...17,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 35,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 1250
TD travel mm: -
mm: (1,6...3,0)
3rd speed 1/min: 1800
TD travel mm: 4,2...5,0
mm: (3,0...5,3)
4th speed 1/min: 2400
TD travel mm: 6,1...6,9
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Supply-pump pressure bar: 1,9...2,9
2nd speed 1/min: 2400
Supply-pump pressure bar: 7,1...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 55...70
quantity cm3/10s: (50...75)
2nd speed 1/min: 2400
Overflow : 82...112
quantity cm3/10s: (77...117)

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Delivery-quant. and breakaway char.:

1st speed 1/min: 2800
Del. quantity cm3/: -
1000H.: 0...4,0
3rd speed 1/min: 2600
Del. quantity cm3/: -
1000H.: (10,0...18,0)
4th speed 1/min: 2500
Del. quantity cm3/: 19,0...29,0
1000H.: (18,0...30,0)
5th speed 1/min: 2400
Del. quantity cm3/: 27,5...29,5
1000H.: (26,3...30,7)
6th speed 1/min: 1000
Del. quantity cm3/: -
1000H.: (26,8...31,2)
7th speed 1/min: 600
Del. quantity cm3/: 22,5...25,5
1000H.: (21,0...27,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -
Del. quantity cm3/: -
1000H.

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del. quantity cm3/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del. quantity cm3/: -
1000H.: (9,0...17,0)
2nd speed 1/min: 425
Del. quantity cm3/: 5,5...8,5
1000H.: (3,0...11,0)

High Idle:

Speed 1/min: 525
Del. quantity cm3/: 7,0...9,0
1000H.: (4,0...12,0)

Residual:

Speed 1/min: 500
Del. quantity : 2,5...4,5
1000H.: (1,0...6,0)

Automatic starting fuel delivery:

1st speed 1/min: 180
Del. quantity cm3/: -
ind. 1000H: 35,0
2nd speed 1/min: 380

Del. quantity cm3/: -
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,7...6,0
MS mm : 1,3..1,55
SVS max. mm : 3,1

Setting of residual delivery.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,9 G
Edition : 16.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 R272
Type number : 0 460 494 211

Customer-specific information
Customer : PEUGEOT

Engine : XUD 9A

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Setting value mm: 3,0...3,4

Supply-pump pressure:

Speed 1/min: 1250
Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

Speed 1/min : 1250
Del. quantity cm3/
1000H.: 29,5...30,5
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 375
Del. quantity cm3/
1000H.: 8,0...10,0
Dispersion cm3/: 2,0
1000H.: (3,0)
Residual-Delivery Setting
Speed 1/min: 550
Del. quantity cm3/
1000H.: 2,5...3,5
Full-load speed regulation:

Speed 1/min: 2500
Del. quantity cm3/
1000H.: 19,0...25,0

Start:

Speed 1/min: 100
Del. quantity mind.
cm3/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 0,6...1,4
2nd speed 1/min: 1250
TD travel mm: -
mm: (2,5...3,9)
3rd speed 1/min: 2000
TD travel mm: 6,7...7,5
mm: (6,4...7,8)

Supply-pump pressure characteristic:

1st speed 1/min: 800
Supply-pump
pressure bar: 2,6...3,2
2nd speed 1/min: 2000
Supply-pump
pressure bar: 5,9...6,5

Overflow quantity at overflow valve:

1st speed 1/min: 800
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2300
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650
Del. quantity cm³/: -
1000H.: 0...10,0
3rd speed 1/min: 2500
Del. quantity cm³/: -
1000H.: (18,0...26,0)
4th speed 1/min: 2250
Del. quantity cm³/: 31,5...34,5
1000H.: (30,8...35,2)
5th speed 1/min: 1250
Del. quantity cm³/: -
1000H.: (27,8...32,2)
6th speed 1/min: 800
Del. quantity cm³/: 30,5...33,5
1000H.: (29,0...35,0)
7th speed 1/min: 500
Del. quantity cm³/: 30,5...33,5
1000H.: (29,0...35,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2300
Del. quantity cm³/: -
1000H.

Idle delivery:

1st speed 1/min: 375
Del. quantity cm³/: -
1000H.: (5,0...13,0)

High Idle:

Speed 1/min: 470
Del. quantity cm³/: 8,0...10,0
1000H.: (5,0...13,0)

Residual:

Speed 1/min: 550
Del. quantity : -
1000H.: 0...7,0

Automatic starting fuel delivery:

1st speed 1/min: 200
Del. quantity cm³/: -
ind. 1000H: 40,0

2nd speed 1/min: 300
Del. quantity cm³/: -
ax. 1000H: 35,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

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Designation

K mm : 3,2...3,4
KF mm : 5,4...5,7
MS mm : 1,3...1,55
SVS max. mm : -

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,9 E1
Edition : 16.12.86
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 R141-1
Type number : 0 460 494 212

Customer-specific information
Customer : FIAT

Engine : X8/43

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6
x Wall thickness : 2
x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500
Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 1500
Del.quantity cm3/
1000H.: 29,2...30,2
Dispersion cm3/: 2,5
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 390
Del.quantity cm3/
1000H.: 9,0...13,0
Dispersion cm3/: 2,5
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2500
Del.quantity cm3/
1000H.: 11,0...17,0

Start:

Speed 1/min: 100
Del.quantity mind.
cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800
TD travel mm: 1,7...2,5
mm: (1,4...2,8)
2nd speed 1/min: 1500
TD travel mm: -
mm: (3,8...5,2)
3rd speed 1/min: 2300
TD travel mm: 7,1...7,9
mm: (6,8...8,2)

Supply-pump pressure characteristic:

1st speed 1/min: 400
Supply-pump pressure bar: 2,8...3,4
2nd speed 1/min: 2300
Supply-pump pressure bar: 7,4...8,0

Overflow quantity at overflow valve:

1st speed 1/min: 400
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2300
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: -

Del.quantity cm3/: -
1000H.: -
2nd speed 1/min: 2600
Del.quantity cm3/: 3,0...10,0
1000H.: (2,5...10,5)
3rd speed 1/min: 2500
Del.quantity cm3/: -
1000H.: (10,0...18,0)
4th speed 1/min: 2400
Del.quantity cm3/: 21,0...27,0
1000H.: (20,0...28,0)
5th speed 1/min: 2250
Del.quantity cm3/: 31,0...33,4
1000H.: (30,0...34,4)
6th speed 1/min: 1500
Del.quantity cm3/: -
1000H.: (26,5...31,9)
7th speed 1/min: 1000
Del.quantity cm3/: 28,9...31,5
1000H.: (28,0...32,4)
8th speed 1/min: 600
Del.quantity cm3/: 30,0...33,0
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:
Speed 1/min: 2300
Del.quantity cm3/: -
1000H.: -

Idle delivery:

1st speed 1/min: 390
Del.quantity cm3/: -
1000H.: (7,0...15,0)
2nd speed 1/min: 440
Del.quantity cm3/: 1,0...7,0
1000H.: (0...8,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300
Del.quantity cm3/: -
ind. 1000H.: 45,0
2nd speed 1/min: 400
Del.quantity cm3/: -
ax. 1000H.: 46,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	3,1...3,4
KF	mm	:	5,7...6,0
MS	mm	:	1,7...1,9
SVS max.	mm	:	2,8
XK	mm	:	20,2...22,2
XL	mm	:	10,3...13,7

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 10,0 Q2
Edition : 12.06.87
Superceeded : 23.9.86
Calibrating oil : ISO-4113

Combination no. : 0 401 846 758

Injection pump
Pump designation : PE6P110A32ORS3108Z
EP type number : 0 411 816 728
Governor
Governor design. : RQV250...1100PA649
Governor no. : 0 421 813 346

Customer-spec. information
Customer : VOLVO

Engine : THD100EB

1st version kW : 160.0
Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
: (2.95...3.15)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing^oCS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 10.50...10.60

Del.quantity cm3/ : 12.2...12.4

100H.: (11.9...12.7)

Dispersion cm3/ : 0.4

100H.: (0.7)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 5.3...5.5

Del.quantity cm3/ : 3.0...3.4

100H.: (2.7...3.6)

Dispersion cm3/ : 0.3

100H.: (0.6)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 250

Sleeve travel mm: 1.10...1.30

2nd speed 1/min: 500

Sleeve travel mm: 4.10...4.90

3rd speed 1/min: 700

Sleeve travel mm: 6.30...6.70

4th speed 1/min: 950

Sleeve travel mm: 6.30...6.70

5th speed 1/min: 1100

Sleeve travel mm: 7.00...7.50

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1175

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700

Charge press. hPa : 750

Del.quantity cm3/ : 122.0...124.0

1000H.: (119.0...127.0)

Dispersion cm3/ : 4.00

1000H.: (7.50)

H24

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 61...69

Testing:

1st c-rod trav.mm : 9.50

Speed 1/min : 1160...1170

2nd c-rod trav.mm : 4.00

Speed 1/min : 1225...1255

4th speed 1/min : 1350

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 7...15

Testing:

Speed 1/min : 100

C-rod trav.mm min : 6.80

Speed 1/min : 250

C-rod trav.mm : 5.30...5.50

C-rod trav.mm : 2.00

Speed 1/min : 350...410

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 750

Contr.-rod trav.mm: 10.50...10.60

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 9.60...9.80

2nd pressure hPa : 265

C-rod trav.mm : 9.90...10.00

3rd pressure hPa : 310

C-rod trav.mm : 10.20...10.40

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -

Speed 1/min : 700

Del.quantity cm3/ : 105.5...108.5

1000H.: (103.0...111.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 160.0...190.0

Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Speed 1/min : 250
Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm3/ : 30.0...34.0
1000H.: (27.5...36.5)
Dispersion cm3/ : 3.00
1000H.: (6.00)

Remarks:

SETTING OF FBG

- Setting and locking of FBG according to start-of-delivery average of all cylinders $19.3...19.7^{\circ}$ ($19.2...19.8^{\circ}$).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position 49° , max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position 48.5° ,
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop.
With $n = 335$ 1/min. and $p_u = 450$ mbar,
control rod must move quickly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,0 P7
Edition : 14.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 074 918
Injection pump
Pump designation : PES4M55C32ORS152-3
EP type number : 0 400 054 967
Governor
Governor design. : RSF360/2300M59-16
Governor no. : 0 420 021 076

Customer-spec. information
Customer : DB

Engine : OM601 (2.0 L)

1st version kW : 53.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
 : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270
Tolerance + - ° : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING.

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.10...11.20

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 335.0

Contr.-rod trav. mm: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.0...32.0

1000H.: (30.0...33.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7.80...8.20

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,90...1,00

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 335

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 225
C-rod trav.mm min : 9.50
Speed 1/min : 335
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 590...690
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 400
Contr.-rod trav.mm: 4.20...4.40
: (4.10...4.50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.10...11.20
2nd speed 1/min : 1800
C-rod trav.mm : 10.80...11.00
3rd speed 1/min : 2200
C-rod trav.mm : 10.30...10.50

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.0...35.0
1000H.: (32.0...36.0)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 335
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.0...6.0
1000H.: (4.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 335
Contr.-rod trav.mm: (12.00...13.40)
Del.quantity cm3/ : (31.00...38.00)
1000H.: -
Electric current A: 1.8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: 0.00...1.00
Electric current
short-duration A : 3.00
Starting test
Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 55.00

Remarks:

SETTING OF FBG

-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction
allowable after switchover point (of
starting cam) up to 1000 1/min.
-Control-lever position 48.5°,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.
With n = 335 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,0 P8
Edition : 07.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 074 919
Injection pump
Pump designation : PES4M55C32ORS152-3
EP type number : 0 410 054 967
Governor
Governor design. : RSF375/2300M55-15
Governor no. : 0 420 021 069

Customer-spec. information
Customer : DB

Engine : OM601 (2.0 L)

1st version kW : 53.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22 00

Cam sequence : 1- 3- 4- ?

J01

SD ang. spacing°CS: 0-90-180-270
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.10...11.20

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 375.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.0...32.0

1000H.: (30.0...33.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,90...1,00

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 375

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 250
C-rod trav.mm min : 11.50
Speed 1/min : 375
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 630...730
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 400
Contr.-rod trav.mm: 4.40...4.60
: (4.30...4.70)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.10...11.20
2nd speed 1/min : 1800
C-rod trav.mm : 10.80...11.00
3rd speed 1/min : 2200
C-rod trav.mm : 10.30...10.50

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.0...35.0
1000H.: (32.0...36.0)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 375
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.0...6.0
1000H.: (4.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 425
Contr.-rod trav.mm: (7.00...8.60)
Del.quantity cm3/ : (13.00...21.00)
1000H.: -
Vacuum hPa : 0.40

Remarks:

SETTING OF FBG

-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,0 P9
Edition : 05.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 074 920
Injection pump
Pump designation : PES4M55C320RS152-3
EP type number : 0 410 054 967
Governor
Governor design. : RSF375/2300M55-14
Governor no. : 0 420 021 068

Customer-spec. information
Customer : DB

Engine : OM601 (2.0 L)

1st version kW : 53.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 3- 4- 2

J03

SD ang. spacing°CS: 0-90-180-270
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.10...11.20

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 375.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.0...32.0

1000H.: (30.0...33.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,90...1,00

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 375

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 250
C-rod trav.mm min : 11.50
Speed 1/min : 375
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 630...730
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 400
Contr.-rod trav.mm: 4.40...4.60
: (4.30...4.70)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.10...11.20
2nd speed 1/min : 1800
C-rod trav.mm : 10.80...11.00
3rd speed 1/min : 2200
C-rod trav.mm : 10.30...10.50

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.0...35.0
1000H.: (32.0...36.0)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 375
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.0...6.0
1000H.: (4.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 425
Contr.-rod trav.mm: (7.00...8.60)
Del.quantity cm3/ : (13.00...21.00)
1000H.: -
Vacuum hPa : 0.40

Remarks:

SETTING OF FBG

-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,4 V1
Edition : 09.03.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 074 921
Injection pump
Pump designation : PES4M55C320RS107-2
EP type number : 0 410 054 962
Governor
Governor design. : RSF375/2250M17
Governor no. : 0 420 021 016

Customer-spec. information
Customer : DB

Engine : OM616 (2.4 L)

1st version kW : 53.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30
 : (2.15...2.35)

Contr.-rod trav.mm: 20.00...0.00

Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270
Tolerance + - ° : 0.00 (1.00)

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.00...13.10

Del.quantity cm3/ : 3.7...3.8

100H.: (3.6...3.9)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 375.0

Contr.-rod trav. m: 6.1...6.3

Del.quantity cm3/ : 0.6...0.7

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 37.5...38.5

1000H.: (36.5...39.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,40...1,50

LOWEST RATED SPEED I

Control-lever

position degrees: 9...13

Setting point w/out aux. spring

Speed 1/min : 375

Contr.-rod trav.mm: 6.2

Testing:

Speed 1/min : 250

C-rod trav.mm min : 10.50

Speed 1/min : 375
C-rod trav.mm : 6.10...6.30
C-rod trav.mm : 2.00
Speed 1/min : 720...820
Speed 1/min : 1000
C-rod trav.mm max : 1.50

SET IDLE AUXILIARY SPRING

Speed 1/min : 450
Contr.-rod trav.mm: 4.90...5.10
 : (4.80...5.20)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 13.00...13.10
2nd speed 1/min : 1800
C-rod trav.mm : 12.00...12.20
3rd speed 1/min : 2200
C-rod trav.mm : 11.70...11.90

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 37.5...39.5
 1000H.: (36.5...40.5)
Dispersion cm3/ : 2.50
 1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 37.5...39.5
 1000H.: (36.5...40.5)
Dispersion cm3/ : 2.50
 1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 53.0...0.0
 1000H.: (53.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 20.0...24.0
 1000H.: (19.0...25.0)
Dispersion cm3/ : 2.50
 1000H.: (3.00)

LOW IDLE

Speed 1/min : 375
Contr.-rod trav.mm: 6.10...6.30
Del.quantity cm3/ : 6.0...7.0
 1000H.: (5.5...9.0)
Dispersion cm3/ : 1.00
 1000H.: (1.50)

Remarks:

J06

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 47°. No
change in control-rod travel after
switchover point up to 550 1/min,
control-lever position 30°. Speed
range 350 1/min...450 1/min.

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.
With n = 375 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,4 V2
Edition : 09.03.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 074 922
Injection pump
Pump designation : PES4M55C320RS107-2
EP type number : 0 410 054 962
Governor
Governor design. : RSF375/2250M18
Governor no. : 0 420 021 017

Customer-spec. information
Customer : DB

Engine : OM616 (2.4 L)

1st version kW : 53.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30
: (2.15...2.35)

Contr.-rod trav.mm: 20.00...0.00

Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270
Tolerance + - : 0.00 (1.00)

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.00...13.10

Del.quantity cm3/ : 3.7...3.8

100H.: (3.6...3.9)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 375.0

Contr.-rod trav. m: 6.1...6.3

Del.quantity cm3/ : 0.6...0.7

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 37.5...38.5

1000H.: (36.5...39.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,40...1,50

LOWEST RATED SPEED I

Control-lever

position degrees: 9...13

Setting point w/out aux. spring

Speed 1/min : 375

Contr.-rod trav.mm: 6.2

Testing:

Speed 1/min : 250

C-rod trav.mm min : 10.50

Speed 1/min : 375
C-rod trav.mm : 6.10...6.30
C-rod trav.mm : 2.00
Speed 1/min : 720...820
Speed 1/min : 1000
C-rod trav.mm max : 1.50

SET IDLE AUXILIARY SPRING

Speed 1/min : 450
Contr.-rod trav.mm: 4.90...5.10
: (4.80...5.20)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 13.00...13.10
2nd speed 1/min : 1800
C-rod trav.mm : 12.00...12.20
3rd speed 1/min : 2200
C-rod trav.mm : 11.70...11.90

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 37.5...39.5
1000H.: (36.5...40.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 37.5...39.5
1000H.: (36.5...40.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 53.0...0.0
1000H.: (53.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 20.0...24.0
1000H.: (19.0...25.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 375
Contr.-rod trav.mm: 6.10...6.30
Del.quantity cm3/ : 6.0...7.0
1000H.: (5.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

Remarks:

J08

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop. With n = 375 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F1
Edition : 30.03.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 075 960
Injection pump
Pump designation : PESSM55C320RS153
EP type number : 0 410 055 991
Governor
Governor design. : RSF350/2300M67-1
Governer no. : 0 420 021 098

Customer-spec. information
Customer : DB

Engine : OM602

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

J09

SD ang. spacing°CS: 0-72-144-216-288
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,90...1,00

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 10.00
Speed 1/min : 350
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 640...740
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 400
Contr.-rod trav.mm: 4,20...4,40
 : (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
 C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
 C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
 C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
 1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
 1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
 1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
 1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
 1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
 1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
 1000H.: (3.00)

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.0...6.0
 1000H.: (4.5...9.0)
Dispersion cm3/ : 1.00
 1000H.: (1.50)

SETTING PNUEUMATIC FAST IDLE (ELA)

Speed 1/min : 400
Contr.-rod trav.mm: (5,20...6,80)
Del.quantity cm3/ : (5,00...13,00)
 1000H.: -
Vacuum hPa : 0,40

Remarks:

SETTING OF FBG

-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction
allowable after switchover point (of
starting cam) up to 1000 1/min.
Control-lever position 46.5°,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F
Edition : 30.03.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 075 961
Injection pump
Pump designation : PES5M55C320RS153
EP type number : 0 410 055 991
Governor
Governor design. : RSF350/2300M67
Governor no. : 0 420 021 094

Customer-spec. information
Customer : DB

Engine : OM602

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing°CS: 0-72-144-216-288
Tolerance + - ° : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

2nd c-rod trav.mm : 7.80

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 10.00
Speed 1/min : 350
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 640...740
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 400
Contr.-rod trav.mm: 4.00...4.40
: (4.10...4.50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.0...6.0
1000H.: (4.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 400
Contr.-rod trav.mm: (5.2...6.8)
Del.quantity cm3/ : -
1000H.: (5.0...13.0)
Vacuum hPa : 0.4

Remarks:

SETTING OF FBG

-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction
allowable after switchover point (of
starting cam) up to 1000 1/min.
Control-lever position 46.5°,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F2
Edition : 07.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 075 964
Injection pump
Pump designation : PESSM55C32ORS162
EP type number : 0 410 055 983
Governor
Governor design. : RSF340/2300M60-15
Governor no. : 0 420 021 081

Customer-spec. information
Customer : DB

Engine : OM602-LVP MJ:86

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80
: (1.65...1.85)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing⁰CS: 0-72-144-216-288
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 315.0

Contr.-rod trav. m: 5.2...5.4

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.0...32.0

1000H.: (30.0...33.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,10...7,50

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,90...2,00

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 315

Contr.-rod trav.mm: 5.3

Testing:

Speed 1/min : 220
C-rod trav.mm min : 7.50
Speed 1/min : 315
C-rod trav.mm : 5.20...5.40
C-rod trav.mm : 2.50
Speed 1/min : 530...630
Speed 1/min : 1000
C-rod trav.mm max : 2.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 380
Contr.-rod trav.mm: 3,90...4,10
: (3,80...4,20)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1600
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2250
C-rod trav.mm : 10.30...10.50

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 1000
Pressure hPa : 930
Contr.-rod trav.mm: 0.10...0.50

Measurement

Speed 1/min : 1000
1st pressure hPa : 840
C-rod trav.mm : 1.10...1.30
2nd pressure hPa : 700
C-rod trav.mm : 2.30...2.70

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1600
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2250
Del.quantity cm3/ : 32.0...34.0
1000H.: (31.0...35.0)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.10...7.50
Del.quantity cm3/ : 16.0...20.0
1000H.: (15.0...21.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 315
Contr.-rod trav.mm: 5.20...5.40
Del.quantity cm3/ : 5.0...6.0
1000H.: (4.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed 1/min : 340
Contr.-rod trav.mm: (12,5...13,9)
Del.quantity cm3/ : (33,0...41,0)
1000H.: -

Electric current A: 1,8

Control lever at full-load stop

Speed 1/min : 2950
Contr.-rod trav.mm: 0...1,0

Electric current

short-duration A : 3,0

Starting test

Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 55,0

Remarks:

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°,
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,

control rod must move quickly to
control-rod travel = 0 mm

START-OF-DELIVERY ADJUSTMENT

-Start-of delivery adjustment and lock
after start-of-delivery mean value of
all cylinders, $17.3...17.7^{\circ}$
($17.2...17.8^{\circ}$) angular displacement of
the cam after cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F4
Edition : 05.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 075 968
Injection pump
Pump designation : PES5M55C320RS153
EP type number : 0 410 055 991
Governor
Governor design. : RSF340/2300M59-14
Governor no. : 0 420 021 074

Customer-spec. information
Customer : DB

Engine : OM602

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing°CS: 0-72-144-216-288
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 315.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 315

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 8.00
Speed 1/min : 315
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 630...730
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 380
Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 315
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.0...6.0
1000H.: (4.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 340
Contr.-rod trav.mm: (12,6...14,0)
Del.quantity cm3/ : -
1000H.: (33,0...41,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: 0,0...1,0
Electric current
short-duration A : 3,0
Starting test
Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 55,0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction
allowable after switchover point (of
starting cam) up to 1000 1/min.
Control-lever position 46.5°,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.
With $n = 315$ 1/min. and $p_u = 450$ mbar,
control rod must move quickly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F5
Edition : 05.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 075 969
Injection pump
Pump designation : PESSM55C32ORS153
EP type number : 0 410 055 991
Governor
Governor design. : RSF350/2300M55-16
Governor no. : 0 420 021 070

Customer-spec. information
Customer : DB

Engine : OM602

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing°CS: 0-72-144-216-288
Tolerance + - ° : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 10.00
Speed 1/min : 350
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 640...740
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 400
Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.0...6.0
1000H.: (4.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 400
Contr.-rod trav.mm: 5,2...6,8
Del.quantity cm3/ : -
1000H.: (5,0...13,0)
Vacuum hPa : 0,40

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 G
Edition : 05.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 075 970
Injection pump
Pump designation : PES5M55C320RS153
EP type number : 0 410 055 991
Governor
Governor design. : RSF350/2300M55-13
Governor no. : 0 420 021 067

Customer-spec. information
Customer : DB

Engine : OM602

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing°CS: 0-72-144-216-288
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 10.00
Speed 1/min : 350
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 640...740
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 400
Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.0...6.0
1000H.: (4.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 400
Contr.-rod trav.mm: (5,2...6,8)
Del.quantity cm3/ : -
1000H.: (5,0...13,0)
Vacuum hPa : 0,40

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W6
Edition : 09.03.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 075 971
Injection pump
Pump designation : PESSM55C320RS108-3
EP type number : 0 410 055 982
Governor
Governor design. : RSF350/2300M16
Governor no. : 0 420 021 015

Customer-spec. information
Customer : DB

Engine : OM617 (3.0 L)

1st version kW : 65.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30
: (2.15...2.35)

Contr.-rod trav.mm: 20.00...0.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing°CS: 0-72-144-216-288
Tolerance + - ° : 0.00 (1.00)

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.00...13.10

Del.quantity cm3/ : 3.7...3.8

100H.: (3.6...3.9)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 6.1...6.3

Del.quantity cm3/ : 0.6...0.7

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 37.5...38.5

1000H.: (36.5...39.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,4...1,5

LOWEST RATED SPEED I

Control-lever

position degrees: 9...13

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 6.2

Testing:

Speed 1/min : 250

C-rod trav.mm min : 9.50

Speed 1/min : 350
C-rod trav.mm : 6.10...6.30
C-rod trav.mm : 2.00
Speed 1/min : 720...820
Speed 1/min : 1000
C-rod trav.mm max : 1.50

SET IDLE AUXILIARY SPRING

Speed 1/min : 450
Contr.-rod trav.mm: 4,70...4,90
 : (4,60...5,00)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 13.00...13.10
2nd speed 1/min : 1800
C-rod trav.mm : 12.00...12.20
3rd speed 1/min : 2200
C-rod trav.mm : 11.70...11.90

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 37.5...39.5
 1000H.: (36.5...40.5)
Dispersion cm3/ : 2.50
 1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 37.5...39.5
 1000H.: (36.5...40.5)
Dispersion cm3/ : 2.50
 1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 53.0...0.0
 1000H.: (53.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 20.0...24.0
 1000H.: (19.0...25.0)
Dispersion cm3/ : 2.50
 1000H.: (3.00)

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 6.10...6.30
Del.quantity cm3/ : 6.0...7.0
 1000H.: (5.5...9.0)
Dispersion cm3/ : 1.00
 1000H.: (1.50)

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W7
Edition : 09.03.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 075 972
Injection pump
Pump designation : PES5M55C32ORS108-3
EP type number : 0 410 055 982
Governor
Governor design. : RSF350/2300M15
Governor no. : 0 420 021 014

Customer-spec. information
Customer : DB

Engine : OM617 (3.0 L)

1st version kW : 65.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2,20...2,30
: (2,15...2,35)

Contr.-rod trav.mm: 20.00...0.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing°CS: 0-72-144-216-288
Tolerance + - : 0.00 (1.00)

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.00...13.10

Del.quantity cm3/ : 3.7...3.8

100H.: (3.6...3.9)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 6.1...6.3

Del.quantity cm3/ : 0.6...0.7

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 37.5...38.5

1000H.: (36.5...39.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,4...1,5

LOWEST RATED SPEED I

Control-lever

position degrees: 9...13

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 6.2

Testing:

Speed 1/min : 250

C-rod trav.mm min : 9.50

Speed 1/min : 350
C-rod trav.mm : 6.10...6.30
C-rod trav.mm : 2.00
Speed 1/min : 720...820
Speed 1/min : 1000
C-rod trav.mm max : 1.50

SET IDLE AUXILIARY SPRING

Speed 1/min : 450
Contr.-rod trav.mm: 4,70...4,90
: (4,60...5,00)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 13.00...13.10
2nd speed 1/min : 1800
C-rod trav.mm : 12.00...12.20
3rd speed 1/min : 2200
C-rod trav.mm : 11.70...11.90

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 37.5...39.5
1000H.: (36.5...40.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 37.5...39.5
1000H.: (36.5...40.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 53.0...0.0
1000H.: (53.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 20.0...24.0
1000H.: (19.0...25.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 6.10...6.30
Del.quantity cm3/ : 6.0...7.0
1000H.: (5.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

Remarks:

J25

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W8
Edition : 12.09.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 075 973
Injection pump
Pump designation : PESSM55C32ORS108-2
EP type number : 0 410 055 984
Governor
Governor design. : RSF350/1700M18-3
Governor no. : 0 420 021 061

Customer-spec. information
Customer : DB

Engine : OM617 (3.0 l)

1st version kW : 54.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30
: (2.15...2.35)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing°CS: 0-72-144-216-288
Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1650

Contr.-rod trav.mm: 11.90...12.00

Del.quantity cm3/ : 3.5...3.6

100H.: (3.4...3.7)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 6.0...6.2

Del.quantity cm3/ : 0.6...0.7

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1650

Del.quantity cm3/ : 35.5...36.5

1000H.: (34.5...37.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 6,80...7,20

Speed 1/min : 1900

4th speed 1/min : 2350

C-rod trav.mm : 0.00...1,00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 600

Contr.-rod trav.mm: 1,4...1,5

LOWEST RATED SPEED I

Control-lever

position degrees: 10...14

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 6.1

Testing:

Speed 1/min : 250

C-rod trav.mm min : 10.00

Speed 1/min : 450
C-rod trav.mm : 4.60...4.80
C-rod trav.mm : 2.00
Speed 1/min : 700...800
Speed 1/min : 300
C-rod trav.mm max : 9.50

SET IDLE AUXILIARY SPRING

Speed 1/min : 450
Contr.-rod trav.mm: 4.60...4.80
: (4.50...4.90)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1650
C-rod trav.mm : 11.90...12.00
2nd speed 1/min : 1200
C-rod trav.mm : 12.10...12.30
3rd speed 1/min : 600
C-rod trav.mm : 12.70...12.90

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1200
Del.quantity cm3/ : 34.5...36.5
1000H.: (33.5...37.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 600
Del.quantity cm3/ : 34.5...36.5
1000H.: (33.5...37.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 1900
Contr.-rod trav.mm: 6.80...7.20
Del.quantity cm3/ : 16.0...20.0
1000H.: (15.0...21.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 350
Contr.-rod trav.mm: 6.00...6.20
Del.quantity cm3/ : 6.0...7.0
1000H.: (5.5...9.0)
Dispersion cm3/ : 1.00
1000H.: (1.50)

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY
SPRING CUTOFF

-Control-lever position 47°. No
change in control-rod travel after
switchover point up to 550 1/min,
control-lever position 30°. Speed
range 350 1/min...450 1/min.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W9
Edition : 30.03.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 076 974
Injection pump
Pump designation : PES6M55C32ORS156
EP type number : 0 410 056 995
Governor
Governor design. : RSF315/2300M66-1
Governor no. : 0 420 021 097

Customer-spec. information
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 0...50

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 7.00
Speed 1/min : 290
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 620...720
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 360
Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm3/ : 1.00
1000H.: (1.50)

K01

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 315
Contr.-rod trav.mm: (12,6...14,0)
Del.quantity cm3/ : (32,0...40,0)
1000H.: -
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-duration A : 3,0
Starting test
Speed 1/min : 100
Del.quantity cm3/ : 55,0
min. 1000H.: -

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

ADJUSTING ACTIVE JOLT DAMPING (ARD)

Control lever at full-load stop. With
 $n = 1000 \text{ 1/min.}$, $I = 2.5 \text{ A}$, control-rod-
travel reduction = $2.25 \dots 2.55 \text{ mm}$

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W10
Edition : 30.03.87
Superceeded : -
Calibrating oil : ISO-4113

Combination no. : 0 400 076 975

Injection pump
Pump designation : PES6M55C320RS156
EP type number : 0 410 056 995
Governor
Governor design. : RSF315/2300M66
Governor no. : 0 420 021 066

Customer-spec. information
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing⁰CS: 0-60-120-180-240-300
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7.80...8.20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0.9...1.0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

K04

Speed 1/min : 220
C-rod trav.mm min : 7.00
Speed 1/min : 290
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 620...720
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 360

Contr.-rod trav.mm: 4.20...4.40
: (4.10...4.50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000

C-rod trav.mm : 11.30...11.40

2nd speed 1/min : 1800

C-rod trav.mm : 10.90...11.10

3rd speed 1/min : 2200

C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800

Del.quantity cm3/ : 34.0...35.5

1000H.: (33.0...36.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

Speed 1/min : 2200

Del.quantity cm3/ : 33.5...35.5

1000H.: (32.5...36.5)

Dispersion cm3/ : 2.50

1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 55.0...0.0

1000H.: (55.0...0.0)

Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500

Contr.-rod trav.mm: 7.80...8.20

Del.quantity cm3/ : 22.0...26.0

1000H.: (21.0...27.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

LOW IDLE

Speed 1/min : 290

Contr.-rod trav.mm: 5.40...5.60

Del.quantity cm3/ : 5.5...6.5

1000H.: (5.0...9.5)

Dispersion cm3/ : 1.00

1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed 1/min : 315

Contr.-rod trav.mm: (12,6...14,0)

Del.quantity cm³/ : -

1000H.: (32,0...40,0)

Electric current A: 1,8

Control lever at full-load stop

Speed 1/min : 2950

Contr.-rod trav.mm: 0,0...1,0

Electric current

short-duration A : 3,0

Starting test

Speed 1/min : 100

Del.quantity cm³/ : 55,0

min. 1000H.: -

Remarks:

SETTING OF FBG

- Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
- Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop.
- At n = 290 1/min and p_u = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position 49°, max.
- 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

ADJUSTING ACTIVE JOLT DAMPING (ARD)

K05

Control lever at full-load stop. With
n = 1000 1/min., I = 2.5 A, control-rod-
travel reduction = 2.25...2.55 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W11
Edition : 07.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 076 978
Injection pump
Pump designation : PES6M55C320RS157-1
EP type number : 0 410 056 991
Governor
Governor design. : RSF315/2300M65-12
Governor no. : 0 420 021 088

Customer-spec. information
Customer : DB

Engine : OM603A

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values _ _ _ _

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30
: (2.15...2.35)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing^oCS: 0-60-120-180-240-300
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100H.: (5.0...5.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Charge press. hPa : 1850

Del.quantity cm3/ : 51.0...52.0

1000H.: (50.0...53.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 8,10...8,50

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,7...1,8

LOWEST RATED SPEED I

Control-lever

position degrees: 8...12

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.4

Testing:

Speed 1/min : 200

C-rod trav.mm min : 7.00

Speed 1/min : 290

C-rod trav.mm : 5.30...5.50

C-rod trav.mm : 2.50

Speed 1/min : 510...610

Speed 1/min : 1000

C-rod trav.mm max : 1.80

SET IDLE AUXILIARY SPRING

Speed 1/min : 360

Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000

C-rod trav.mm : 13.90...14.00

2nd speed 1/min : 1600

C-rod trav.mm : 13.20...13.40

3rd speed 1/min : 2200

C-rod trav.mm : 12.30...12.50

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 1000

Pressure hPa : 1600

Contr.-rod trav.mm: 0.50...0.90

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050

C-rod trav.mm : 3.90...4.10

2nd pressure hPa : 750

C-rod trav.mm : 5.80...6.20

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 1850

Speed 1/min : 1600

Del.quantity cm3/ : 50.0...51.5

1000H.: (49.0...52.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

Charge press. hPa : 1850

Speed 1/min : 2200

Del.quantity cm3/ : 48.5...50.5

1000H.: (47.5...51.5)

Dispersion cm3/ : 2.50

1000H.: 3.00

Charge press. hPa : 1050

Speed 1/min : 1000

Del.quantity cm3/ : 33.0...34.0

1000H.: (32.0...35.0)

Dispersion cm³/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm³/ : 52.0...0.0
1000H.: (52.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

1st version
Charge press. hPa : 1850
Speed 1/min : 2500
Contr.-rod trav.mm: 8.10...8.50
Del.quantity cm³/ : 29.0...33.0
1000H.: (28.0...34.0)
Dispersion cm³/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm³/ : 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm³/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 315
Contr.-rod trav.mm: (12,8...14,2)
Del.quantity cm³/ : -
1000H.: (42,0...49,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-duration A : 3,0
Starting test
Speed 1/min : 100
Del.quantity cm³/ : -
min. 1000H.: 52,0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W12
Edition : 07.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 076 979
Injection pump
Pump designation : PES6M55C32ORS157-1
EP type number : 0 410 056 991
Governor
Governor design. : RSF315/2300M65-10
Governor no. : 0 420 021 087

Customer-spec. information
Customer : DB

Engine : OM603A Touring

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30
: (2.15...2.35)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K09

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100H.: (5.0...5.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Charge press. hPa : 1850

Del.quantity cm3/ : 51.0...52.0

1000H.: (50.0...53.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 8,10...8,50

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,7...1,8

LOWEST RATED SPEED I

Control-lever

position degrees: 8...12

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.4

Testing:

Speed 1/min : 200
C-rod trav.mm min : 7.00
Speed 1/min : 290
C-rod trav.mm : 5.30...5.50
C-rod trav.mm : 2.50
Speed 1/min : 510...610
Speed 1/min : 1000
C-rod trav.mm max : 1.80

SET IDLE AUXILIARY SPRING

Speed 1/min : 360
Contr.-rod trav.mm: 4,20...4,40
 : (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 13.90...14.00
2nd speed 1/min : 1600
C-rod trav.mm : 13.20...13.40
3rd speed 1/min : 2200
C-rod trav.mm : 12.30...12.50

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 1000
Pressure hPa : 1600
Contr.-rod trav.mm: 0.50...0.90

Measurement

Speed 1/min : 1000
1st pressure hPa : 1050
C-rod trav.mm : 3.90...4.10
2nd pressure hPa : 750
C-rod trav.mm : 5.80...6.20

FUEL-DELIVERY CHARACTERISTICS

1st version
Charge press. hPa : 1850
Speed 1/min : 1600
Del.quantity cm3/ : 50.0...51.5
 1000H.: (49.0...52.5)
Dispersion cm3/ : 2.50
 1000H.: (3.00)
Charge press. hPa : 1850
Speed 1/min : 2200
Del.quantity cm3/ : 48.5...50.5
 1000H.: (47.5...51.5)
Dispersion cm3/ : 2.50
 1000H.: 3.00
Charge press. hPa : 1050
Speed 1/min : 1000
Del.quantity cm3/ : 33.0...34.0
 1000H.: (32.0...35.0)

Dispersion cm3/ : 2.50
 1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 52.0...0.0
 1000H.: (52.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

1st version

Charge press. hPa : 1850
Speed 1/min : 2500
Contr.-rod trav.mm: 8.10...8.50
Del.quantity cm3/ : 29.0...33.0
 1000H.: (28.0...34.0)
Dispersion cm3/ : 2.50
 1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm3/ : 5.5...6.5
 1000H.: (5.0...9.5)
Dispersion cm3/ : 1.00
 1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 315
Contr.-rod trav.mm: (12,8...14,2)
Del.quantity cm3/ : -
 1000H.: (42,0...49,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-duration A : 3,0
Starting test
Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 52,0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At $n = 290$ 1/min and $p_u = 450$ mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49° , max.
0.2 mm control-rod travel deduction
allowable after switchover point (of
starting cam) up to 1000 1/min.
Control-lever position 46.5° ,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W14
Edition : 07.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 076 982
Injection pump
Pump designation : PES6M55C32ORS156
EP type number : 0 410 056 995
Governor
Governor design. : RSF315/2300M60-14
Governor no. : 0 420 021 080

Customer-spec. information
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K12

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - ° : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 7.00
Speed 1/min : 290
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 620...720
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 360
Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 1000
Pressure hPa : 930
Contr.-rod trav.mm: 0.10...0.50

Measurement

Speed 1/min : 1000
1st pressure hPa : 840
C-rod trav.mm : 1.10...1.30
2nd pressure hPa : 700
C-rod trav.mm : 2.30...2.70

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 315
Contr.-rod trav.mm: (12,6...14,0)
Del.quantity cm3/ : -
1000H.: (32,0...40,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-duration A : 3,0
Starting test
Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 55,0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY
SPRING CUTOFF

- Control-lever position 49° , max.
0.2 mm control-rod travel deduction
allowable after switchover point (of
starting cam) up to 1000 1/min.
- Control-lever position 46.5° ,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W15
Edition : 14.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 076 983
Injection pump
Pump designation : PES6M55C32ORS15b
EP type number : 0 410 056 995
Governor
Governor design. : RSF315/2300M59-15
Governor no. : 0 420 021 075

Customer-spec. information
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing⁰CS: 0-60-120-180-240-300
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 0...50

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 7.00
Speed 1/min : 290
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 620...720
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 360
Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 315
Contr.-rod trav.mm: (12,6...14,0)
Del.quantity cm3/ : -
1000H.: (32,0...40,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-duration A : 3,0
Starting test
Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 55,0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W16
Edition : 07.11.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 076 984
Injection pump
Pump designation : PES6M55C320RS156
EP type number : 0 410 056 995
Governor
Governor design. : RSF315/2300M59-13
Governor no. : 0 420 021 073

Customer-spec. information
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 7.00
Speed 1/min : 290
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 620...720
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 360
Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 315
Contr.-rod trav.mm: (12,6...14,0)
Del.quantity cm3/ : -
1000H.: (32,0...40,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-duration A : 3,0
Starting test
Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 55,0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W17
Edition : 12.09.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 076 985
Injection pump
Pump designation : PES6M55C32ORS157-1
EP type number : 0 410 056 991
Governor
Governor design. : RSF315/2300M65-2
Governor no. : 0 420 021 062

Customer-spec. information
Customer : DB

Engine : OM603A

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30
: (2.15...2.35)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K19

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100H.: (5.0...5.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Charge press. hPa : 1850

Del.quantity cm3/ : 51.0...52.0

1000H.: (50.0...53.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 8,10...8,50

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1,00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,7...1,8

LOWEST RATED SPEED I

Control-lever

position degrees: 8...12

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.4

Testing:

Speed 1/min : 200
C-rod trav.mm min : 7.00
Speed 1/min : 360
C-rod trav.mm : 4.20...4.40
C-rod trav.mm : 2.50
Speed 1/min : 510...610
Speed 1/min : 1000
C-rod trav.mm max : 1.80

SET IDLE AUXILIARY SPRING

Speed 1/min : 360
Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 13.90...14.00
2nd speed 1/min : 1600
C-rod trav.mm : 13.20...13.40
3rd speed 1/min : 2200
C-rod trav.mm : 12.30...12.50

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 1000
Pressure hPa : 1600
Contr.-rod trav.mm: 0.50...0.90

Measurement

Speed 1/min : 1000
1st pressure hPa : 1050
C-rod trav.mm : 3.90...4.10
2nd pressure hPa : 750
C-rod trav.mm : 5.80...6.20

FUEL-DELIVERY CHARACTERISTICS

1st version
Charge press. hPa : 1850
Speed 1/min : 1600
Del.quantity cm3/ : 50.0...51.5
1000H.: (49.0...52.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Charge press. hPa : 1850
Speed 1/min : 2200
Del.quantity cm3/ : 48.5...50.5
1000H.: (47.5...51.5)
Dispersion cm3/ : 2.50
1000H.: 3.00
Charge press. hPa : 1050
Speed 1/min : 1000
Del.quantity cm3/ : 33.0...34.0
1000H.: (32.0...35.0)

Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

1st version
Charge press. hPa : 1850
Speed 1/min : 2500
Contr.-rod trav.mm: 8.10...8.50
Del.quantity cm3/ : 29.0...33.0
1000H.: (28.0...34.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm3/ : 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 315
Contr.-rod trav.mm: (12,8...14,2)
Del.quantity cm3/ : -
1000H.: (42,0...49,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-duration A : 3,0
Starting test
Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 52,0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At $n = 290$ 1/min and $p_u = 450$ mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49° , max.
0.2 mm control-rod travel deduction
allowable after switchover point (of
starting cam) up to 1000 1/min.
Control-lever position 46.5° ,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W5
Edition : 12.09.86
Superceeded : 04.86
Calibrating oil : ISO-4113
Combination no. : 0 400 076 988
Injection pump
Pump designation : PES6M55C32ORS156
EP type number : 0 410 056 995
Governor
Governor design. : RSF315/2300M60-4
Governor no. : 0 420 021 057

Customer-spec. information
Customer : DB

Engine : DM603-3.0

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K22

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance ° - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1,00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 7.00
Speed 1/min : 360
C-rod trav.mm : 4.20...4.40
C-rod trav.mm : 1.50
Speed 1/min : 620...720
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 360
Contr.-rod trav.mm: 4.20...4.40
: (4.10...4.50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 1000
Pressure hPa : 930
Contr.-rod trav.mm: 0.10...0.50

Measurement

Speed 1/min : 1000

1st pressure hPa : 840
C-rod trav.mm : 1.10...1.30
2nd pressure hPa : 700
C-rod trav.mm : 2.30...2.70

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

K23

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed 1/min : 315
Contr.-rod trav.mm: (12.6...14.0)
Del.quantity cm3/ : -
1000H.: (32.0...40.0)

Electric current A: 1.8
Control lever at full-load stop

Speed 1/min : 2950
Contr.-rod trav.mm: (0.0...1.0)

Electric current
short-duration A : 3.0

Starting test

Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 55.0

Remarks:

Pin projection = 16.60...16.70 mm

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.

At $n = 290$ 1/min and $p_u = 450$ mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49° , max.
0.2 mm control-rod travel deduction
allowable after switchover point (of
starting cam) up to 1000 1/min.
Control-lever position 46.5° ,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3.0 W1
Edition : 09.03.87
Superceeded : 11.85
Calibrating oil : ISO-4113

Combination no. : 0 400 076 990

Injection pump
Pump designation : PES6M55C320RS156
EP type number : 0 410 056 995
Governor
Governor design. : RSF315/2300M59-5
Governor no. : 0 420 021 045

Customer-spec. information
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 0...50

3rd c-rod trav.mm : 7.80...8.20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0.9...1.0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 7.00
Speed 1/min : 290
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 620...720
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 360
Contr.-rod trav.mm: 4.20...4.40
: (4.10...4.50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 315
Contr.-rod trav.mm: (12.6...14.0)
Del.quantity cm3/ : -
1000H.: (32.0...40.0)
Electric current A: 1.8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: (0.0...1.0)
Electric current
short-duration A : 3.0
Starting test
Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 55.0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)
between max/min value 1° cam angle
maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction
allowable after switchover point (of
starting cam) up to 1000 1/min.
Control-lever position 46.5°
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W
Edition : 09.03.87
Superceeded : 11.85
Calibrating oil : ISO-4113
Combination no. : 0 400 076 994
Injection pump
Pump designation : PES6M55C320RS156
EP type number : 0 410 056 995
Governor
Governor design. : RSF315/2300M59-3
Governor no. : 0 420 021 040

Customer-spec. information
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K27

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220
C-rod trav.mm min : 7.00
Speed 1/min : 290
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 1.50
Speed 1/min : 620...720
Speed 1/min : 1000
C-rod trav.mm max : 1.00

SET IDLE AUXILIARY SPRING

Speed 1/min : 360
Contr.-rod trav.mm: 4,20...4,40
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000
C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800
Del.quantity cm3/ : 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/ : 2.50
1000H.: (3.00)
Speed 1/min : 2200
Del.quantity cm3/ : 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/ : 2.50
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 55.0...0.0
1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500
Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/ : 2.50
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290
Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/ : 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm3/ : 1.00
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min : 315
Contr.-rod trav.mm: (12,6...14,0)
Del.quantity cm3/ : -
1000H.: (32,0...40,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min : 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-duration A : 3,0
Starting test
Speed 1/min : 100
Del.quantity cm3/ : -
min. 1000H.: 55,0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 9,6 N 1
Edition : 12.09.86
Superceeded : 10.85
Calibrating oil : ISO-4113

Combination no. : 0 400 646 266

Injection pump
Pump designation : PE6A95D410LS2587
EP type number : 0 410 696 983
Governor
Governor design. : RQV300...1150AB1088L
Governor no. : 0 420 212 115

Customer-spec. information
Customer : KHD

Engine : F6L413

1st version kW : 115.0
Speed 1/min: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
: (1.45...1.65)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 6- 5- 4- 3- 2

SD ang. spacing⁰CS: 0-75-120-195-240-315
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 8.30...8.40

Del.quantity cm3/ : 7.2...7.4

100H.: (7.0...7.6)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100H.: (0.6...1.7)

Dispersion cm3/ : 0.3

100H.: (0.5)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1.20...1.30

2nd speed 1/min: 400

Sleeve travel mm: 2.30...2.70

3rd speed 1/min: 600

Sleeve travel mm: 3.00...3.50

4th speed 1/min: 1195

Sleeve travel mm: 8.40...8.50

5th speed 1/min: 1235

Sleeve travel mm: 8.90...9.10

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1190

Cont.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Del.quantity cm3/ : 72.0...74.0

1000H.: (70.0...76.0)

Dispersion cm3/ : 3.50

1000H.: (6.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 61...69

Testing:

1st c-rod trav.mm : 7.30

Speed 1/min : 1190...1200

2nd c-rod trav.mm : 4.00

Speed 1/min : 1220...1250

4th speed 1/min : 1350

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 68...76

Testing:

Speed 1/min : 100

C-rod trav.mm min : 8.00

Speed 1/min : 300

C-rod trav.mm : 6.40...6.60

CONSTANT REGULATION

Speed 1/min : 320...420

TORQUE CONTROL

Dimension a mm : 1.00

Torque-control curve - 1st version

1st speed 1/min : 1150

C-rod trav.mm : 8.30...8.40

2nd speed 1/min : 500

C-rod trav.mm : 9.30...9.40

3rd speed 1/min : 935

C-rod trav.mm : 9.00...9.20

4th speed 1/min : 1045

C-rod trav.mm : 8.50...8.70

SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800

Del.quantity cm3/ : 78.0...81.0

1000H.: (75.5...83.5)

Speed 1/min : 800

Del.quantity cm3/ : 93.5...101.5

1000H.: (96.0...104.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 120.0...130.0

1000H.: (117.0...133.0)

Contr.-rod trav.mm: 14.40...14.80

Remarks:

On activation of the starting solenoid,

L02

the start position must be reached.

2. Set fuel delivery in fuel-delivery characteristics with stop above the governor housing.

When accelerating from engine speed "0", no voltage in starting solenoid.

APPLICATION

Below-ground operation

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 12.7 N1
Edition : 12.09.86
Superceeded : 10.85
Calibrating oil : ISO-4113
Combination no. : 0 400 648 124
Injection pump
Pump designation : PE8A95D410LS2588
EP type number : 0 410 698 989
Governor
Governor design. : RQV300...1150AB1088
Governor no. : 0 420 212 115

Customer-spec. information
Customer : KHD

Engine : F8L413FW

1st version kW : 153.0
Speed 1/min: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
: (1.45...1.65)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 8- 7- 2- 6- 5-
4- 3

SD ang. spacing°CS: 0-45-90-135-180-225-
270-315

Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 9.30...9.40

Del.quantity cm3/ : 7.1...7.3

100H.: (6.9...7.5)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 6.2...6.4

Del.quantity cm3/ : 1.4...2.0

100H.: (1.1...2.2)

Dispersion cm3/ : 0.3

100H.: (0.5)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1.20...1.30

2nd speed 1/min: 400

Sleeve travel mm: 2.20...2.60

3rd speed 1/min: 600

Sleeve travel mm: 3.00...3.50

4th speed 1/min: 1195

Sleeve travel mm: 8.50...8.50

5th speed 1/min: 1245

Sleeve travel mm: 9.10...9.30

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1200

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Del.quantity cm3/ : 71.0...73.0

1000H.: (69.0...75.0)

Dispersion cm³/ : 3.50
1000H.: (6.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 61...69

Testing:

1st c-rod trav.mm : 8.30
Speed 1/min : 1190...1200
2nd c-rod trav.mm : 4.00
Speed 1/min : 1230...1260
4th speed 1/min : 1350
C-rod trav.mm : 0.001.00

LOWEST RATED SPEED I

Control-lever

position degrees: 8...16

Testing:

Speed 1/min : 100
C-rod trav.mm min : 7.80
Speed 1/min : 300
C-rod trav.mm : 6.20...6.40

CONSTANT REGULATION

Speed 1/min : 320...430

TORQUE CONTROL

Dimension a mm : 1.00
Torque-control curve - 1st version
1st speed 1/min : 1150
C-rod trav.mm : 9.30...9.40
2nd speed 1/min : 500
C-rod trav.mm : 10.30...10.40
3rd speed 1/min : 935
C-rod trav.mm : 10.00...10.20
4th speed 1/min : 1045
C-rod trav.mm : 9.50...9.70

SWITCH-OVER 0INT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800
Del.quantity cm³/ : 77.5...80.5
1000H.: (75.0...83.0)
Speed 1/min : 800
Del.quantity cm³/ : 98.5...101.5
1000H.: (96.0...104.0)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm³/ : 120.0...130.0
1000H.: (117.0...133.0)
Contr.-rod trav.mm: 15.40...15.80

L04

On activation of the starting solenoid,
the start position must be reached.

2. Set fuel delivery in fuel-delivery
characteristics with stop above the
governor housing.

When accelerating from engine speed
"0", no voltage in starting solenoid.

APPLICATION

Below-ground operation

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 12,7 P4
Edition : 15.05.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 648 145
Injection pump
Pump designation : PE8A95D410LS2608
EP type number : 0 410 698 980
Governor
Governor design. : RQ300/1100AB1230L
Governor no. : 0 420 200 108

Customer-spec. information
Customer : KHD

Engine : F8L413F

1st version kW : 162.0
Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 8- 7- 2- 6- 5-
4- 3

SD ang. spacing°CS: 0-45-90-135-180-225-
270-315

Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 10.00...10.10

Del.quantity cm3/ : 8.9...9.1

100H.: (8.7...9.3)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 6.4...6.6

Del.quantity cm3/ : 1.0...1.6

100H.: (0.7...1.8)

Dispersion cm3/ : 0.5

100H.: (0.7)

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 550

Contr.-rod travelmm: 15.60...16.40

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Del.quantity cm3/ : 89.0...91.0

1000H.: (87.0...93.0)

Dispersion cm3/ : 3.50

1000H.: (6.00)

HIGHEST RATED SPEED

Setting point:

Speed 1/min : 550

Contr.-rod trav.mm: 16.0

Testing:

1st c-rod trav.mm : 9.00

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4.00

Speed 1/min : 1205...1235

LOWEST RATED SPEED I

Setting point w/out aux. spring
Speed 1/min : 300
Contr.-rod trav.mm: 6.5

Testing:

Speed 1/min : 100
C-rod trav.mm min : 8.00
Speed 1/min : 300
C-rod trav.mm : 6.40...6.60
C-rod trav.mm : 2.00
Speed 1/min : 355...395

TORQUE CONTROL

Dimension a mm : 0.25
Torque-control curve - 1st version
1st speed 1/min : 1100
C-rod trav.mm : 10.00...10.10
2nd speed 1/min : 550
C-rod trav.mm : 10.50...10.60
3rd speed 1/min : 785
C-rod trav.mm : 10.30...10.50
4th speed 1/min : 915
C-rod trav.mm : 10.10...10.30

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 650
Del.quantity cm3/ : 90.5...93.5
1000H.: (88.0...96.0)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 120.0...130.0
1000H.: (117.0...133.0)
Contr.-rod trav.mm: 14.70...15.70

Remarks: 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 15.8 N1
Edition : 15.05.87
Superceeded : 10.85
Calibrating oil : ISO-4113

Combination no. : 0 400 649 219

Injection pump
Pump designation : PE10A95D610/4LS2589
EP type number : 0 410 699 994
Governor
Governor design. : RQV300...1150AB1047D
L
Governer no. : 0 420 214 242

Customer-spec. information
Customer : KHD

Engine : F10L413

1st version kW : 192.0
Speed 1/min: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
: (1.45...1.65)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1-10- 9- 4- 3- 6-
5- 8- 7- 2

SD ang. spacing°CS: 0-27-72-99-144-171-
216-243-288-315
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 9.30...9.40

Del.quantity cm3/ : 6.9...7.1

100H.: (6.7...7.3)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 7.2...7.4

Del.quantity cm3/ : 1.4...2.0

100H.: (1.1...2.2)

Dispersion cm3/ : 0.3

100H.: (0.5)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1.20...1.30

2nd speed 1/min: 400

Sleeve travel mm: 2.20...2.60

3rd speed 1/min: 600

Sleeve travel mm: 3.00...3.50

4th speed 1/min: 1195

Sleeve travel mm: 8.40...8.50

5th speed 1/min: 1235

Sleeve travel mm: 9.10...9.30

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1190

Cont.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Del.quantity cm3/ : 69.0...71.0

1000H.: (67.0...73.0)

Dispersion cm3/ : 3.50
1000H.: (6.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 61...69

Testing:

1st c-rod trav.mm : 8.30

Speed 1/min : 1190...1200

2nd c-rod trav.mm : 4.00

Speed 1/min : 1230...1260

4th speed 1/min : 1350

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 10...18

Testing:

Speed 1/min : 100

C-rod trav.mm min : 7.80

Speed 1/min : 300

C-rod trav.mm : 7.20...7.40

CONSTANT REGULATION

Speed 1/min : 320...430

TORQUE CONTROL

Dimension a mm : 1.00

Torque-control curve - 1st version

1st speed 1/min : 1150

C-rod trav.mm : 9.30...9.40

2nd speed 1/min : 500

C-rod trav.mm : 10.30...10.40

3rd speed 1/min : 935

C-rod trav.mm : 10.00...10.20

4th speed 1/min : 1045

C-rod trav.mm : 9.50...9.70

SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800

Del.quantity cm3/ : 75.5...78.5

1000H.: (73.0...81.0)

Speed 1/min : 800

Del.quantity cm3/ : 98.5...101.5

1000H.: (96.0...104.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 120.0...130.0

1000H.: (117.0...133.0)

Contr.-rod trav.mm: 15.40...15.80

L08

Remarks:

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 6,0 H 6
 Edition : 12.09.86
 Superceeded : 10.84
 Calibrating oil : ISO-4113
 Combination no. : 0 400 656 159
 Injection pump
 Pump designation : PE6A85D412RS2303Y
 EP type number : 0 410 686 940
 Governor
 Governor design. : RQV250...1400AB879DL
 Governor no. : 0 420 214 186

Customer-spec. information
 Customer : STEYR

Engine : WD612.90

1st version kW : 154.0

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60
 : (2.45...2.65)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
 Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1400

Contr.-rod trav.mm: 14.20...14.30

Del.quantity cm3/ : 9.6...9.7

100H.: (9.4...9.9)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 8.9...9.1

Del.quantity cm3/ : 1.0...1.5

100H.: (0.8...1.7)

Dispersion cm3/ : 0.2

100H.: (0.4)

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1450

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1400

Charge press. hPa : 700

Del.quantity cm3/ : 96.0...97.0

1000H.: (94.0...99.0)

Dispersion cm3/ : 3.00

1000H.: (4.50)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 43...51

Testing:

1st c-rod trav.mm : 13.20

Speed 1/min : 1440...1450

2nd c-rod trav.mm : 4.00

Speed 1/min : 1580...1610

3rd c-rod trav.mm : 0.00...1.00

Speed 1/min : 1700

LOWEST RATED SPEED I

Control-lever

position degrees: 9...17

Testing:

Speed 1/min : 100
C-rod trav.mm min : 10.40
C-rod trav.mm : 2.00
Speed 1/min : 380...440
Speed 1/min : 500
C-rod trav.mm max : 1.00

CONSTANT REGULATION

Speed 1/min : 340...450

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 1400
Pressure hPa : 700
Contr.-rod trav.mm: 14.20...14.30

Measurement

Speed 1/min : 1400

1st pressure hPa : -
C-rod trav.mm : 12.50...12.60
2nd pressure hPa : 240
C-rod trav.mm : 13.80...13.90
3rd pressure hPa : 220
C-rod trav.mm : 12.90...13.10

SWITCH-OVER POINT

Speed 1/min : 170 (190)

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700
Speed 1/min : 800
Del.quantity cm3/ : 91.5...94.5
1000H.: (89.5...96.5)
Dispersion cm3/ : 4.00
1000H.: (5.50)
Charge press. hPa : -
Speed 1/min : 500
Del.quantity cm3/ : 60.5...63.5
1000H.: (58.5...65.5)
Dispersion cm3/ : 4.00
1000H.: 5.50

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : HAN 7,2 B 1
 Edition : 13.05.87
 Superseded : -
 Calibrating oil : ISO-4113
 Combination no. : 0 400 674 045
 Injection pump
 Pump designation : PE4A9SD42ORS2662-1
 EP type number : 0 10 694 994
 Governor
 Governor design. : RSV350...1100A8C2222
 R
 Governor no. : 0 420 232 487
 Customer-spec. information
 Customer : HANOMAG
 Engine : D944 T
 1st version kW : 93.0
 Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42
 Inlet press., bar : 1.00
 Calibrating nozzle-holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test inj. tubing : 1 680 750 003
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 2.15...2.25
 : (2.10...2.30)
 Contr.-rod trav.mm: 9.00...12.00
 Cam sequence : 1- 2- 4- 3

SD ang. spacing⁰CS: 0-90-180-270
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1080

 Contr.-rod trav.mm: 11.00...11.10

 Del.quantity cm3/ : 10.6...10.8

 100H.: (10.4...11.0)

 Dispersion cm3/ : 0.3

 100H.: (0.6)

 2nd speed 1/min: 350.0
 Contr.-rod trav. m: 7.4...7.6
 Del.quantity cm3/ : 3.2...3.8
 100H.: (2.9...4.0)
 Dispersion cm3/ : 0.3
 100H.: (0.5)

SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed 1/min: 800
 Cont.-rod travelmm: 0.30...0.70
 Governor-spring reload
 Notch setting x : 3.75

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
 Speed 1/min: 1080
 Del.quantity cm3/ : 106.0...108.0
 1000H.: (104.0...110.0)
 Dispersion cm3/ : 3.50
 1000H.: (6.00)

HIGHEST RATED SPEED

1st version
 Control-lever
 position degrees: 44...52

Testing:

1st c-rod trav.mm : 10.00
 Speed 1/min : 1120...1130
 2nd c-rod trav.mm : 4.00
 Speed 1/min : 1140...1175
 3rd c-rod trav.mm : 4.00
 Speed 1/min : 1165...1195
 4th speed 1/min : 1340
 C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever

position degrees: 13...21

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 7.0

Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 350

C-rod trav.mm : 7.40...7.60

C-rod trav.mm : 2.00

Speed 1/min : 490...550

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1080

C-rod trav.mm : 11.00...11.10

2nd speed 1/min : 500

C-rod trav.mm : 11.90...12.00

4th speed 1/min : 670

C-rod trav.mm : 11.40...11.70

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 109.0...112.0

1000H.: (106.5...114.5)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 132.0...142.0

1000H.: (129.0...145.0)

Contr.-rod trav.mm: 19.50...21.00

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : LIE 5,6 B
Edition : 13.05.87
Superceeded : 12.9.86
Calibrating oil : ISO-4113

Combination no. : 0 400 844 085

Injection pump
Pump designation : PES4A100D410RS2686
EP type number : 0 410 804 001
Governor
Governor design. : RQV400...1000AB1203L
Governor no. : 0 420 212 177

Customer-spec. information
Customer : LIEBHERR

Engine : D904T

1st version kW : 100.0
Speed 1/min: 2000

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80
: (2.65...2.85)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 3- 4- 2

SD ang. spacing⁰CS: 0-90-180-270
Tolerance + - ° : 0.50 (0.75)

START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 9.00...12.00
Difference⁰ CS : 4.00...5.00

BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 12.50...12.60

Del.quantity cm3/ : 12.1...12.3
100H.: (11.9...12.5)

Dispersion cm3/ : 0.3
100H.: (0.6)

2nd speed 1/min: 400.0
Contr.-rod trav. m: 7.4...7.6
Del.quantity cm3/ : 1.5...2.1
100H.: (1.2...2.3)
Dispersion cm3/ : 0.3
100H.: (0.5)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 450
Sleeve travel mm: 4.20...4.40
2nd speed 1/min: 580
Sleeve travel mm: 3.60...3.90
3rd speed 1/min: 1040
Sleeve travel mm: 7.80...7.90
4th speed 1/min: 1140
Sleeve travel mm: 9.00...9.20

SLEEVE POSITION

Control-lever position
Degree: 1
Speed 1/min: 1000
Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
Speed 1/min: 1000
Charge press. hPa : 800
Del.quantity cm3/ : 121.5...123.5
1000H.: (119.5...125.5)

Dispersion cm3/ : 3.50
1000H.: (6.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 58...66

Testing:

1st c-rod trav.mm : 11.50

Speed 1/min : 1040...1050

2nd c-rod trav.mm : 4.00

Speed 1/min : 1125...1155

3rd c-rod trav.mm : 4.00

4th speed 1/min : 1250

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 9...17

Testing:

Speed 1/min : 100

C-rod trav.mm min : 8.50

Speed 1/min : 400

C-rod trav.mm : 6.90...7.10

CONSTANT REGULATION

Speed 1/min : 435...540

TORQUE CONTROL

Dimension a mm : 1.30

Torque-control curve - 1st version

1st speed 1/min : 1000

C-rod trav.mm : 12.50...12.60

2nd speed 1/min : 500

C-rod trav.mm : 13.80...13.90

4th speed 1/min : 860

C-rod trav.mm : 13.30...13.50

5th speed 1/min : 920

C-rod trav.mm : 12.90...13.10

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 800

Contr.-rod trav.mm: 13.80...13.90

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 12.70...12.80

2nd pressure hPa : 655

C-rod trav.mm : 13.60...13.70

3rd pressure hPa : 610

C-rod trav.mm : 13.00...13.20

L14

SWITCH-OVER POINT

Speed 1/min : 320 (340)

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 800

Speed 1/min : 650

Del.quantity cm3/ : 133.5...136.5

1000H.: (131.0...139.0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 104.0...107.0

1000H.: (102.0...109.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 113.0...123.0

1000H.: (110.0...126.0)

Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

Speed 1/min : 400

Contr.-rod trav.mm: 7.40...7.60

Del.quantity cm3/ : 15.0...21.0

1000H.: (12.5...23.5)

Dispersion cm3/ : 3.50

1000H.: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 9,2 0 3
Edition : 30.03.87
Superceeded : 12.9.86
Calibrating oil : ISO-4113

Combination no. : 0 400 845 072

Injection pump
Pump designation : PESSA95D410LS2543
EP type number : 0 410 895 978
Governor
Governor design. : RQV250...1100AB1177-
1L
Governor no. : 0 420 212 163

Customer-spec. information
Customer : MAN

Engine : D2565 M/MF

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 003

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
: (1.45...1.65)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 3- 5- 4- 2

SD ang. spacing^oCS: 0-72-144-216-288
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 5

BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 11.00...11.10

Del.quantity cm3/ : 11.0...11.2
100H.: (10.8...11.4)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 250.0
Contr.-rod trav. m: 6.5...6.7
Del.quantity cm3/ : 0.8...1.4
100H.: (0.5...1.6)
Dispersion cm3/ : 0.3
100H.: (0.5)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 150
Sleeve travel mm: 0.40...0.70
2nd speed 1/min: 550
Sleeve travel mm: 3.60...4.00
3rd speed 1/min: 900
Sleeve travel mm: 5.60...6.10
4th speed 1/min: 1200
Sleeve travel mm: 9.50...10.30

SLEEVE POSITION

Control-lever position
Degree: -1
Speed 1/min: 1140
Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
Speed 1/min: 1100
Del.quantity cm3/ : 110.5...112.5
1000H.: (108.5...114.5)
Dispersion cm3/ : 3.50
1000H.: (6.00)

HIGHEST RATED SPEED

1st version
Control-lever
position degrees: 42...50

Testing:

1st c-rod trav.mm : 10.00
Speed 1/min : 1140...1150
2nd c-rod trav.mm : 4.00
Speed 1/min : 1180...1210
4th speed 1/min : 1300
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever
position degrees: 8...16

Testing:

Speed 1/min : 100
C-rod trav.mm min : 8.10
Speed 1/min : 250
C-rod trav.mm : 6.50...6.70
C-rod trav.mm : 2.00
Speed 1/min : 335...395

TORQUE CONTROL

Dimension a mm : 0.35
Torque-control curve - 1st version
1st speed 1/min : 1100
C-rod trav.mm : 11.00...11.10
2nd speed 1/min : 500
C-rod trav.mm : 11.40...11.50
4th speed 1/min : 900
C-rod trav.mm : 11.10...11.40

SWITCH-OVER POINT

Speed 1/min : 170 (190)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500
Del.quantity cm3/ : 0.0...111.5
1000H.: (0.0...113.5)
Speed 1/min : 750
Del.quantity cm3/ : 106.5...110.5
1000H.: (104.5...112.5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 146.5...156.5
1000H.: (143.5...159.5)
Contr.-rod trav.mm: 16.90...17.50

Remarks:

Set idle stop at 250 min. -1 to a
control-rod travel of 6.5 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OMB 8,1 A 1
 Edition : 26.06.87
 Superseded : 5.84
 Calibrating oil : ISO-4113
 Combination no. : 0 400 846 396
 Injection pump
 Pump designation : PES6A90D41ORS2494
 EP type number : 0 410 896 057
 Governor
 Governor design. : RQ275/1300AB969DL
 Governor no. : 0 420 202 278

Customer-spec. information
 Customer : IVECO-OM

Engine : 8360.05.200

1st version kW : 117.7
 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25
 : (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00

L17

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1300

Contr.-rod trav.mm: 13.20...13.30

Del.quantity cm3/ : 8.0...8.1

100H.: (7.8...8.3)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 275.0

Contr.-rod trav. m: 8.3...8.5

Del.quantity cm3/ : 0.4...0.9

100H.: (0.2...1.1)

Dispersion cm3/ : 0.4

100H.: (0.4)

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 900

Cont.-rod travelmm: 13.60...15.00

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1300

Del.quantity cm3/ : 80.0...81.0

1000H.: (78.0...83.0)

Dispersion cm3/ : 3.00

1000H.: (4.50)

HIGHEST RATED SPEED

Setting point:

Speed 1/min : 900

Contr.-rod trav.mm: 14.3

Testing:

1st c-rod trav.mm : 12.20

Speed 1/min : 1345...1360

2nd c-rod trav.mm : 4.00

Speed 1/min : 1440...1470

4th speed 1/min : 1600

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Setting point w/out aux. spring
Speed 1/min : 275
Contr.-rod trav.mm: 5.8

Testing:

Speed 1/min : 100
C-rod trav.mm min : 7.30
Speed 1/min : 275
C-rod trav.mm : 5.70...5.90
C-rod trav.mm : 2.00
Speed 1/min : 420...480
Speed 1/min : 600
C-rod trav.mm max : 1.00

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1300
C-rod trav.mm : 13.20...13.30
2nd speed 1/min : 500
C-rod trav.mm : 13.80...13.90
3rd speed 1/min : 700
C-rod trav.mm : 13.70...13.90

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500
Del.quantity cm3/ : 71.5...74.5
1000H.: (69.0...77.0)
Speed 1/min : 700
Del.quantity cm3/ : 77.5...80.5
1000H.: (75.0...83.0)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 112.0...122.0
1000H.: (109.0...125.0)
Contr.-rod trav.mm: 19.50...21.00

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,1P14
Edition : 12.09.86
Superceeded : 10.85
Calibrating oil : ISO-4113
Combination no. : 0 400 846 419
Injection pump
Pump designation : PES6A95D410LS2542
EP type number : 0 410 896 936
Governor
Governor design. : RQ250/1100AB965DL
Governor no. : 0 420 202 270

Customer-spec. information
Customer : MAN

Engine : D2566 M/MF

1st version kW : 176.5
Speed 1/min: 2200
2nd version kW : 168.0
Speed 1/min: 1500

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
 : (1.45...1.65)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 6

BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 12.00...12.10

Del.quantity cm3/ : 12.4...12.6

100H.: (12.2...12.8)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 5.9...6.1

Del.quantity cm3/ : 0.8...1.4

100H.: (0.5...1.6)

Dispersion cm3/ : 0.3

100H.: (0.5)

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 600

Contr.-rod travelmm: 15.60...16.40

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Del.quantity cm3/ : 124.5...126.5

1000H.: (122.5...128.5)

Dispersion cm3/ : 3.00

1000H.: (6.00)

2nd version

Speed 1/min: 1100

Del.quantity cm3/ : 118.0...120.0 *

1000H.: (116.0...122.0)

HIGHEST RATED SPEED

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 16.0

Testing:

1st c-rod trav.mm : 11.00

Speed 1/min : 1145...1160
2nd c-rod trav.mm : 4.00
Speed 1/min : 1185...1215
4th speed 1/min : 1300
C-rod trav.mm : 0.00...1.00

Setting point:

Speed 1/min : 600
Contr.-rod trav.mm: 16.0

Testing:

1st c-rod trav.mm : 11.00
Speed 1/min : 1145...1160
2nd c-rod trav.mm : 4.00
Speed 1/min : 1185...1215
4th speed 1/min : 1300
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Setting point w/out aux. spring
Speed 1/min : 250
Contr.-rod trav.mm: 6.0

Testing:

Speed 1/min : 100
C-rod trav.mm min : 7.50
Speed 1/min : 250
C-rod trav.mm : 5.90...6.10
C-rod trav.mm : 2.00
Speed 1/min : 360...420
Speed 1/min : 500
C-rod trav.mm max : 1.00

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1100
C-rod trav.mm : 12.00...12.10
2nd speed 1/min : 500
C-rod trav.mm : 12.00...12.20

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500
Del.quantity cm3/ : 107.5...113.5
1000H.: (105.0...116.0)
Speed 1/min : 750
Del.quantity cm3/ : 110.5...113.5
1000H.: (108.0...116.0)
Speed 1/min : 500
Del.quantity cm3/ : 102.0...108.0 *
1000H.: (100.0...110.0)
Speed 1/min : 750
Del.quantity cm3/ : 106.0...109.0 *
1000H.: (104.0...111.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

L20

Del.quantity cm3/ : 125.0...135.0
1000H.: (122.0...138.0)
Contr.-rod trav.mm: 14.00...14.60

Remarks:

: MAN-NR. 2-7283

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : RAB 9,7 B 1
Edition : 13.05.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 846 543
Injection pump
Pump designation : PES6A95D420LS2595
EP type number : 0 410 896 930
Governor
Governor design. : RQ200/1100AB1210R
Governor no. : 0 420 201 643

Customer-spec. information
Customer : RABA

Engine : D2156MT6U

1st version kW : 188.0
Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.05)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing^oCS: 0-60-120-180-240-300
Tolerance + - ^o : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 12.60...12.70

Del.quantity cm3/ : 12.6...12.8

100H.: (12.4...13.0)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 200.0

Contr.-rod trav. m: 7.3...7.5

Del.quantity cm3/ : 0.9...1.5

100H.: (0.6...1.7)

Dispersion cm3/ : 0.3

100H.: (0.5)

SLEEVE POSITION

Control-lever position

Degree: -2

Speed 1/min: 600

Contr.-rod travelmm: 19.20...20.60

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Charge press. hPa : 700

Del.quantity cm3/ : 126.5...128.5

1000H.: (124.5...130.5)

Dispersion cm3/ : 3.00

1000H.: (6.00)

HIGHEST RATED SPEED

Testing:

1st c-rod trav.mm : 11.60

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4.00

Speed 1/min : 1190...1220

LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 200

Contr.-rod trav.mm: 6.4

Testing:

L22

Speed 1/min : 100

C-rod trav.mm min : 7.60

Speed 1/min : 200

C-rod trav.mm : 6.30...6.50

C-rod trav.mm : 2.00

Speed 1/min : 320...360

Speed 1/min : 450

C-rod trav.mm max : 1.00

TORQUE CONTROL

Dimension a mm : 1.20

Torque-control curve - 1st version

1st speed 1/min : 1100

C-rod trav.mm : 12.60...12.70

2nd speed 1/min : 600

C-rod trav.mm : 13.80...14.00

3rd speed 1/min : 865

C-rod trav.mm : 13.40...13.70

4th speed 1/min : 985

C-rod trav.mm : 13.00...13.20

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 13.80...13.90

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 11.10...11.20

2nd pressure hPa : 340

C-rod trav.mm : 12.80...12.90

3rd pressure hPa : 250

C-rod trav.mm : 11.20...11.40

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700

Speed 1/min : 700

Del.quantity cm3/ : 135.0...138.0

1000H.: (133.0...140.0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 82.5...84.5

1000H.: (80.5...86.5)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 145.0...155.0

1000H.: (142.0...158.0)

Contr.-rod trav.mm: 17.00...17.40

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

Set idle stop at 250 min. -1 to a
control-rod travel of 6.5 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,9 A
 Edition : 12.09.86
 Superceeded : -
 Calibrating oil : ISO-4113
 Combination no. : 0 400 846 547
 Injection pump
 Pump designation : PES6A90D41ORS2713
 EP type number : 0 410 896 083
 Governor
 Governor design. : RQV300...1350AB1175-
 1L
 Governor no. : 0 420 212 183

Customer-spec. information
 Customer : FIAT

Engine : 8060.25.661

1st version kW : 88.0
 Speed 1/min: 2700

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30
 : (2.15...2.35)

Contr.-rod trav.mm: 9.00...12.00
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1350

Contr.-rod trav.mm: 11.70...11.80

Del.quantity cm3/ : 6.8...6.9

100H.: (6.6...7.1)

Dispersion cm3/ : 0.3

100H.: (0.5)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 9.7...9.9

Del.quantity cm3/ : 1.2...1.8

100H.: (1.0...2.0)

Dispersion cm3/ : 0.2

100H.: (0.4)

(B) Setting of injection pump with
 externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 0.90...1.10

2nd speed 1/min: 435

Sleeve travel mm: 2.40...2.60

3rd speed 1/min: 780

Sleeve travel mm: 4.20...4.40

4th speed 1/min: 1400

Sleeve travel mm: 8.10...8.20

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1430

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1350

Charge press. hPa : 700

Del.quantity cm3/ : 68.0...69.0

1000H.: (66.0...71.0)

Dispersion cm3/ : 3.00

1000H.: (5.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 55...63

Testing:

1st c-rod trav.mm : 10.70

Speed 1/min : 1390...1400

2nd c-rod trav.mm : 4.00

Speed 1/min : 1515...1545

4th speed 1/min : 1650

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 14...21

Testing:

Speed 1/min : 100

C-rod trav.mm min : 11.20

Speed 1/min : 300

C-rod trav.mm : 9.70...9.90

CONSTANT REGULATION

Speed 1/min : 350...450

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1350

C-rod trav.mm : 11.70...11.80

2nd speed 1/min : 500

C-rod trav.mm : 11.70...11.90

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 11.70...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 11.40...11.50

2nd pressure hPa : 260

C-rod trav.mm : 11.60...11.70

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700

Speed 1/min : 800

Del.quantity cm3/ : 57.5...59.5

1000H.: (55.0...62.0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 46.5...48.5

1000H.: (44.5...50.5)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 46.5...48.5

1000H.: (44.5...50.5)

Contr.-rod trav.mm: 18.10...18.50

Remarks:

Test electrically-released starting quantity (EES) with 12 volts

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,9 A 1
Edition : 12.09.86
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 846 550
Injection pump
Pump designation : PES6A90D410RS2713
EP type number : 0 410 896 083
Governor
Governor design. : RQV300...1350AB1175-3L
Governor no. : 0 420 212 192

Customer-spec. information
Customer : FIAT

Engine : 8060.25.640

1st version kW : 103.0
Speed 1/min: 2700

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30
: (2.15...2.35)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1350

Contr.-rod trav.mm: 11.70...11.80

Del.quantity cm3/ : 6.8...6.9

100H.: (6.6...7.1)

Dispersion cm3/ : 0.3

100H.: (0.5)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 9.7...9.9

Del.quantity cm3/ : 1.2...1.8

100H.: (1.0...2.0)

Dispersion cm3/ : 0.2

100H.: (0.4)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 0.90...1.10

2nd speed 1/min: 435

Sleeve travel mm: 2.40...2.60

3rd speed 1/min: 780

Sleeve travel mm: 4.20...4.40

4th speed 1/min: 1400

Sleeve travel mm: 8.10...8.20

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1430

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1350

Charge press. hPa : 700

Del.quantity cm3/ : 68.5...69.5

1000H.: (66.5...71.5)

Dispersion cm3/ : 3.00

1000H.: (5.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 55...63

Testing:

1st c-rod trav.mm : 10.70

Speed 1/min : 1390...1400

2nd c-rod trav.mm : 4.00

Speed 1/min : 1515...1545

4th speed 1/min : 1650

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 14...21

Testing:

Speed 1/min : 100

C-rod trav.mm min : 11.20

Speed 1/min : 300

C-rod trav.mm : 9.70...9.90

CONSTANT REGULATION

Speed 1/min : 350...450

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1350

C-rod trav.mm : 11.70...11.80

2nd speed 1/min : 500

C-rod trav.mm : 11.70...11.90

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 11.70...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 11.20...11.30

2nd pressure hPa : 260

C-rod trav.mm : 11.40...11.50

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700

Speed 1/min : 800

Del.quantity cm3/ : 59.0...61.0

1000H.: (56.5...63.5)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 44.0...46.0

1000H.: (42.0...48.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 105.0...115.0

1000H.: (102.0...118.0)

Contr.-rod trav.mm: 18.10...18.50

Remarks:

Test electrically-released starting quantity (EES) with 12 volts

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5.9 B
Edition : 13.05.87
Superceeded : 12.9.86
Calibrating oil : ISO-4113
Combination no. : 0 400 846 551
Injection pump
Pump designation : PES6A90D410RS2723
EP type number : 0 410 896 085
Governor
Governor design. : RQV300...1500AB1152-1L
Governor no. : 0 420 212 195

Customer-spec. information
Customer : IVECO-FIAT

Engine : 8060.05.661

1st version kW : 81.0
Speed 1/min: 3000

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30
(2.15...2.35)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing⁰CS: 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1500

Contr.-rod trav.mm: 9.00...9.10

Del.quantity cm3/ : 4.7...4.8

100H.: (4.5...5.0)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 8.2...8.4

Del.quantity cm3/ : 1.0...1.6

100H.: (0.8...1.8)

Dispersion cm3/ : 0.2

100H.: (0.4)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 345

Sleeve travel mm: 2.20...2.40

2nd speed 1/min: 410

Sleeve travel mm: 2.80...3.20

3rd speed 1/min: 630

Sleeve travel mm: 4.30...4.70

4th speed 1/min: 1545

Sleeve travel mm: 8.60...8.70

5th speed 1/min: 1650

Sleeve travel mm: 9.30...9.50

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1525

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1500

Del.quantity cm3/ : 47.5...48.5

1000H.: (45.5...50.5)

Dispersion cm3/ : 3.00

1000H.: (4.50)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 55...63

Testing:

1st c-rod trav.mm : 8.00

Speed 1/min : 1540...1550

2nd c-rod trav.mm : 4.00

Speed 1/min : 1635...1665

4th speed 1/min : 1800

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 15...23

Testing:

Speed 1/min : 100

C-rod trav.mm min : 9.00

Speed 1/min : 300

C-rod trav.mm : 8.20...8.40

CONSTANT REGULATION

Speed 1/min : 330...430

TORQUE CONTROL

Dimension a mm : 1.30

Torque-control curve - 1st version

1st speed 1/min : 1500

C-rod trav.mm : 9.00...9.10

2nd speed 1/min : 500

C-rod trav.mm : 10.30...10.40

3rd speed 1/min : 785

C-rod trav.mm : 9.90...10.10

4th speed 1/min : 1210

C-rod trav.mm : 9.30...9.50

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 43.0...45.0

1000H.: (40.5...47.5)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 95.0...105.0

1000H.: (92.0...108.0)

Contr.-rod trav.mm: 15.70...16.10

Remarks:

Test electrically-released starting
quantity (EES) with 12 volts

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,9 A 2
 Edition : 15.05.87
 Superceeded : -
 Calibrating oil : ISO-4113
 Combination no. : 0 400 846 557
 Injection pump
 Pump designation : PES6A90D410RS2713
 EP type number : 0 410 896 083
 Governor
 Governor design. : RQV300...1350AB1175-SL
 Governor no. : 0 420 212 199

Customer-spec. information
 Customer : FIAT -

Engine : 8060.25.630

TEST BENCH REQUIREMENTS

Calibrating oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30
 : (2.15...2.35)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1350

Contr.-rod trav.mm: 11.50...11.60

Del.quantity cm3/ : 7.6...7.7

100H.: (7.4...7.9)

Dispersion cm3/ : 0.3

100H.: (0.5)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 8.4...8.6

Del.quantity cm3/ : 1.0...1.6

100H.: (0.8...1.8)

Dispersion cm3/ : 0.2

100H.: (0.4)

(B) Setting of injection pump with
 externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 0.80...0.90

2nd speed 1/min: 435

Sleeve travel mm: 2.30...2.70

3rd speed 1/min: 660

Sleeve travel mm: 3.80...4.20

4th speed 1/min: 1395

Sleeve travel mm: 7.70...7.80

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1470

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1350

Charge press. hPa : 700

Del.quantity cm3/ : 76.5...77.5

1000H.: (74.5...79.5)

Dispersion cm3/ : 3.00

1000H.: (5.00)

HIGHEST RATED SPEED

1st version

Control-lever
position degrees: 54...62

Testing:

1st c-rod trav.mm : 10.50
Speed 1/min : 1390...1400
2nd c-rod trav.mm : 4.00
Speed 1/min : 1520...1550
4th speed 1/min : 1650
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever
position degrees: 10...18

Testing:

Speed 1/min : 100
C-rod trav.mm min : 9.90
Speed 1/min : 300
C-rod trav.mm : 8.40...8.60

CONSTANT REGULATION

Speed 1/min : 360...460

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1350
C-rod trav.mm : 11.50...11.60
2nd speed 1/min : 500
C-rod trav.mm : 11.50...11.70

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500
Pressure hPa : 700
Contr.-rod trav.mm: 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : -
C-rod trav.mm : 10.50...10.60
2nd pressure hPa : 348
C-rod trav.mm : 11.30...11.40
3rd pressure hPa : 330
C-rod trav.mm : 10.90...11.10

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700
Speed 1/min : 800
Del.quantity cm3/ : 68.5...70.5
1000H.: (66.0...73.0)
Charge press. hPa : -
Speed 1/min : 500
Del.quantity cm3/ : 47.0...49.0
1000H.: (45.0...51.0)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 115.0...125.0
1000H.: (112.0...128.0)
Contr.-rod trav.mm: 17.10...17.50

Test electrically-released starting
quantity (EES) with 12 volts

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 6,0 A 4
Edition : 03.04.87
Superceeded : -
Calibrating oil : ISO-4113

Combination no. : 0 400 846 563

Injection pump
Pump designation : PES6A90D410RS2667
EP type number : 0 410 896 080
Governor
Governor design. : RQV300...1200AB1065-15L
Governor no. : 0 420 212 210

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35
 : (2.20...2.40)
Contr.-rod trav.mm: 9.00...12.00

M04

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing⁰CS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1200

Contr.-rod trav.mm: 11.10...11.20

Del.quantity cm3/ : 5.8...5.9

100H.: (5.6...6.1)

Dispersion cm3/ : 0.3

100H.: (0.5)

2nd speed 1/min: 300.0
Contr.-rod trav. m: 8.9...9.1
Del.quantity cm3/ : 0.9...1.3
100H.: (0.7...1.5)
Dispersion cm3/ : 0.2
100H.: (0.4)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 300
Sleeve travel mm: 0.80...1.30
2nd speed 1/min: 500
Sleeve travel mm: 2.30...2.80
3rd speed 1/min: 750
Sleeve travel mm: 4.30...4.70
4th speed 1/min: 1260
Sleeve travel mm: 8.40...8.60

SLEEVE POSITION

Control-lever position
Degree: -1
Speed 1/min: 1260
Cont.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
Speed 1/min: 1200
Del.quantity cm3/ : 58.0...59.0
1000H.: (56.0...61.0)
Dispersion cm3/ : 3.00
1000H.: (5.00)

HIGHEST RATED SPEED

1st version
Control-lever
position degrees: 56...64

Testing:

1st c-rod trav.mm : 10.10
Speed 1/min : 1240...1250
2nd c-rod trav.mm : 4.00
Speed 1/min : 1330...1360
4th speed 1/min : 1500
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever
position degrees: 16...24

Testing:

Speed 1/min : 100
C-rod trav.mm min : 10.30
Speed 1/min : 300
C-rod trav.mm : 8.90...9.10

CONSTANT REGULATION

Speed 1/min : 540...680

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1200
C-rod trav.mm : 11.10...11.20
2nd speed 1/min : 600
C-rod trav.mm : 12.30...12.40
3rd speed 1/min : 900
C-rod trav.mm : 11.80...12.00
4th speed 1/min : 1000
C-rod trav.mm : 11.30...11.60

SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600
Del.quantity cm3/ : 54.0...56.0
1000H.: (51.5...58.5)
Speed 1/min : 900
Del.quantity cm3/ : 56.0...59.0
1000H.: (53.5...61.5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 78.0...88.0
1000H.: (75.0...91.0)
Contr.-rod trav.mm: 17.00...17.40

Remarks:

Set shutoff stop to contact at
3.0...3.5 mm control-rod travel.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 4,1 D
 Edition : 13.05.87
 Superceeded : 1.86
 Calibrating oil : ISO-4113
 Combination no. : 0 400 864 063
 Injection pump
 Pump designation : PES4A85D410/3RS2638
 EP type number : 0 410 884 950
 Governor
 Governor design. : RSV325...1400A8C707-3L
 Governor no. : 0 420 232 440
 Customer-spec. information
 Customer : KHD

Engine : BF4L913

1st version kW : 78.0
 Speed 1/min: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60
 : (2.45...2.65)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 3- 4- 2

SD ang. spacing^oCS: 0-90-180-270
Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1250

Contr.-rod trav.mm: 12.70...12.80

Del.quantity cm3/ : 8.2...8.3

100H.: (8.0...8.5)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 325.0
Contr.-rod trav. m: 8.4...8.6
Del.quantity cm3/ : 0.8...1.4
100H.: (0.6...1.6)
Dispersion cm3/ : 0.2
100H.: (0.4)

SLEEVE POSITION

Control-lever position
Degree: -3
Speed 1/min: 800
Contr.-rod travelmm: 0.30...0.70

Governor-spring reload
Notch setting x : 4.00

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
Speed 1/min: 1250
Charge press. hPa : 700
Del.quantity cm3/ : 82.5...83.5
1000H.: (80.5...85.5)
Dispersion cm3/ : 3.00
1000H.: (4.50)

HIGHEST RATED SPEED

1st version
Control-lever
position degrees: 49...57

Testing:
1st c-rod trav.mm : 11.70
Speed 1/min : 1290...1300
2nd c-rod trav.mm : 4.00
Speed 1/min : 1315...1345
3rd c-rod trav.mm : 4.00
Speed 1/min : 1360...1390

M07

4th speed 1/min : 1540
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever
position degrees: 9...17
Seiting point w/out aux. spring
Speed 1/min : 325
Contr.-rod trav.mm: 8.0
Speed 1/min : 325
C-rod trav.mm : 8.40...8.60
C-rod trav.mm : 2.00
Speed 1/min : 620...680

TORQUE CONTROL

Torque-control curve - 1st version
1st speed 1/min : 1250
C-rod trav.mm : 12.70...12.80
2nd speed 1/min : 500
C-rod trav.mm : 13.70...13.80
3rd speed 1/min : 850
C-rod trav.mm : 13.50...13.60
4th speed 1/min : 950
C-rod trav.mm : 13.20...13.40

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 500
Pressure hPa : 700
Contr.-rod trav.mm: 13.70...13.80

Measurement

Speed 1/min : 500
1st pressure hPa : -
C-rod trav.mm : 12.30...12.40
2nd pressure hPa : 390
C-rod trav.mm : 13.50...13.60
3rd pressure hPa : 250
C-rod trav.mm : 12.80...13.00

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700
Speed 1/min : 850
Del.quantity cm3/ : 84.5...86.5
1000H.: (82.0...89.0)
Charge press. hPa : -
Speed 1/min : 500
Del.quantity cm3/ : 59.5...61.5
1000H.: (57.5...63.5)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 95.0...105.0
1000H.: (92.0...108.0)
Contr.-rod trav.mm: 17.10...17.30

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 6,1 A 5
 Edition : 13.05.87
 Superceeded : -
 Calibrating oil : ISO-4113
 Combination no. : 0 400 866 080
 Injection pump
 Pump designation : PES6A85D410/3RS2415
 EP type number : 0 410 886 915
 Governor
 Governor design. : RSV325...1400A8C707-4L
 Governor no. : 0 420 232 461

Customer-spec. information
 Customer : KHD

Engine : BF6L913

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
 x Wall thickness : 6.00X2.00X600
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00
 : (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing⁰CS: 0-60-120-180-240-300
 Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1400

 Contr.-rod trav.mm: 10.80...10.90

 Del.quantity cm3/ : 7.6...7.7

 100H.: (7.4...7.9)

 Dispersion cm3/ : 0.3

 100H.: (0.4)

 2nd speed 1/min: 325.0
 Contr.-rod trav. m: 7.9...8.1
 Del.quantity cm3/ : 0.9...1.5
 100H.: (0.7...1.7)
 Dispersion cm3/ : 0.2
 100H.: (0.4)

SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed 1/min: 800
 Cont.-rod travelmm: 0.30...0.70

Governor-spring reload
 Notch setting x : 5.25

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
 Speed 1/min: 1400
 Charge press. hPa : 700
 Del.quantity cm3/ : 76.0...77.0
 1000H.: (74.0...79.0)
 Dispersion cm3/ : 3.00
 1000H.: (4.50)

HIGHEST RATED SPEED

1st version
 Control-lever
 position degrees: 65...73

Testing:
 1st c-rod trav.mm : 9.80
 Speed 1/min : 1440...1450
 2nd c-rod trav.mm : 4.00
 Speed 1/min : 1470...1500
 3rd c-rod trav.mm : 4.00
 Speed 1/min : 1505...1535
 4th speed 1/min : 1600
 C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever

position degrees: 14...22

Setting point w/out aux. spring

Speed 1/min : 325

Contr.-rod trav.mm: 7.5

Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 325

C-rod trav.mm : 7.90...8.10

C-rod trav.mm : 2.00

Speed 1/min : 600...660

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1400

C-rod trav.mm : 10.80...10.90

2nd speed 1/min : 500

C-rod trav.mm : 12.00...12.10

3rd speed 1/min : 1040

C-rod trav.mm : 11.40...11.60

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 12.00...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 10.50...10.60

2nd pressure hPa : 360

C-rod trav.mm : 11.70...11.80

3rd pressure hPa : 95

C-rod trav.mm : 10.60...10.80

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 44.0...47.0

1000H.: (42.0...49.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 105.0...115.0

1000H.: (102.0...118.0)

Contr.-rod trav.mm: 17.10...17.30

LOW IDLE

M10

Speed 1/min : 325

Contr.-rod trav.mm: 7.90...8.10

Del.quantity cm3/ : 9.5...15.5

1000H.: (7.5...17.5)

Dispersion cm3/ : 2.00

1000H.: (4.00)

Remarks:

Test electrically-released starting quantity (EES) with 12 volts

The stop position of the control rod must be easily reached with the stop lever

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 6,1 A 7
Edition : 13.05.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 866 120
Injection pump
Pump designation : PES6A85D410/3RS2415
EP type number : 0 410 886 915
Governor
Governor design. : RSV325...1150A8C673-
1L
Governor no. : 0 420 232 489

Customer-spec. information
Customer : KHD

Engine : BF6L913

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00
: (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 11.00...11.10

Del.quantity cm3/ : 6.8...6.9

100H.: (6.6...7.1)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 325.0
Contr.-rod trav. m: 8.0...8.2
Del.quantity cm3/ : 0.9...1.5
100H.: (0.7...1.7)
Dispersion cm3/ : 0.2
100H.: (0.4)

SLEEVE POSITION

Control-lever position
Degree: -3
Speed 1/min: 800
Cont.-rod travelmm: 0.30...0.70

Governor-spring reload
Notch setting x : 4.30

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
Speed 1/min: 1150
Del.quantity cm3/ : 68.0...69.0
1000H.: (66.0...71.0)
Dispersion cm3/ : 3.00
1000H.: (4.50)

HIGHEST RATED SPEED

1st version
Control-lever
position degrees: 49...57

Testing:
1st c-rod trav.mm : 10.00
Speed 1/min : 1190...1200
2nd c-rod trav.mm : 4.00
Speed 1/min : 1215...1245
3rd c-rod trav.mm : 4.00
Speed 1/min : 1235...1265
4th speed 1/min : 1400
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever
position degrees: 13...21
Setting point w/out aux. spring
Speed 1/min : 325
Contr.-rod trav.mm: 5.0

Testing:

Speed 1/min : 100
C-rod trav.mm min : 19.50
Speed 1/min : 325
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 2.00
Speed 1/min : 505...565

TORQUE CONTROL

Torque-control curve - 1st version
1st speed 1/min : 1150
C-rod trav.mm : 11.00...11.10
2nd speed 1/min : 500
C-rod trav.mm : 11.70...11.80
4th speed 1/min : 990
C-rod trav.mm : 11.30...11.50

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 100.0...110.0
1000H.: (97.0...113.0)
Contr.-rod trav.mm: 16.70...17.30

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 M 12
 Edition : 22.05.87
 Superceeded : -
 Calibrating oil : ISO-4113
 Combination no. : 0 400 876 108
 Injection pump
 Pump designation : PES6A80D410RS2085X
 EP type number : 0 410 886 045
 Governor
 Governor design. : RSV350...1425A2C1001
 L
 Governor no. : 0 420 232 464

Customer-spec. information
 Customer : DAIMLER-BENZ

Engine : OM352

1st version kW : 66.0
 Speed 1/min: 2850

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25
 : (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing^DCS: 0-60-120-180-240-300
 Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1400

Contr.-rod trav.mm: 8.50...8.60

Del.quantity cm3/ : 4.1...4.2

100H.: (4.0...4.4)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 7.4...7.6

Del.quantity cm3/ : 1.0...1.4

100H.: (0.8...1.5)

Dispersion cm3/ : 0.2

100H.: (0.3)

SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...1.00

Governor-spring reload
 Notch setting x : 4.00

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1400

Del.quantity cm3/ : 41.5...42.5

1000H.: (40.0...44.0)

Dispersion cm3/ : 2.00

1000H.: (3.50)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 46...54

Testing:

1st c-rod trav.mm : 7.50

Speed 1/min : 1455...1465

2nd c-rod trav.mm : 4.00

Speed 1/min : 1475...1505

3rd c-rod trav.mm : 4.00

Speed 1/min : 1525...1555

4th speed 1/min : 1600

C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 7.5

Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 350

C-rod trav.mm : 7.40...7.60

C-rod trav.mm : 2.00

Speed 1/min : 730...790

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1400

C-rod trav.mm : 8.50...8.60

2nd speed 1/min : 500

C-rod trav.mm : 9.80...9.90

3rd speed 1/min : 800

C-rod trav.mm : 8.80...9.10

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 40.5...42.5

1000H.: (38.5...44.5)

Speed 1/min : 800

Del.quantity cm3/ : 39.0...41.0

1000H.: (37.0...43.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 78.0...88.0

1000H.: (75.0...91.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : RAB 9,7 D
Edition : 22.05.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 876 251
Injection pump
Pump designation : PES6A95D410RS2108
EP type number : 0 410 896 983
Governor
Governor design. : RSV450...1050A1C607L
Governor no. : 0 420 232 381

Customer-spec. information
Customer : RABA

Engine : D2156 HMT6

1st version kW : 180.0
Speed 1/min: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.70...1.80
: (1.65...1.85)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 1050

Contr.-rod trav.mm: 13.60...13.70

Del.quantity cm3/ : 13.3...13.5
100H.: (13.1...13.7)

Dispersion cm3/ : 0.3
100H.: (0.5)

2nd speed 1/min: 450.0
Contr.-rod trav. m: 6.2...6.4
Del.quantity cm3/ : 1.1...1.7
100H.: (0.8...1.9)
Dispersion cm3/ : 0.3
100H.: (0.5)

SLEEVE POSITION

Control-lever position
Degree: -3
Speed 1/min: 800
Contr.-rod travelmm: 0.30...0.70

Governor-spring reload
Notch setting x : 4.50

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
Speed 1/min: 1050
Del.quantity cm3/ : 133.5...135.5
1000H.: (131.5...137.5)
Dispersion cm3/ : 3.50
1000H.: (5.50)

HIGHEST RATED SPEED

1st version
Control-lever
position degrees: 50...58

Testing:
1st c-rod trav.mm : 12.60
Speed 1/min : 1090...1100
2nd c-rod trav.mm : 4.00
Speed 1/min : 1125...1155
3rd c-rod trav.mm : 4.00
Speed 1/min : 1160...1190

4th speed 1/min : 1300
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever
position degrees: 22...30
Setting point w/out aux. spring
Speed 1/min : 450
Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 100
C-rod trav.mm min : 19.50
Speed 1/min : 450
C-rod trav.mm : 5.90...6.10
C-rod trav.mm : 2.00
Speed 1/min : 560...620

TORQUE CONTROL

Torque-control curve - 1st version
1st speed 1/min : 1050
C-rod trav.mm : 13.60...13.70
2nd speed 1/min : 500
C-rod trav.mm : 13.60...13.80
3rd speed 1/min : 300
C-rod trav.mm : 14.40...15.00

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 750
Del.quantity cm3/ : 131.5...135.5
1000H.: (129.5...137.5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 193.0...203.0
1000H.: (190.0...206.0)
Contr.-rod trav.mm: 19.50...21.00

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 6,1 D1
Edition : 7.86
Superceeded : -
Calibrating oil : ISO-4113

Combination no. : 0 400 876 270

Injection pump
Pump designation : PES6A85D410/3RS2537
Governor
Governor design. : RSV325...1150A8B2020
DL

Customer-spec. information
Customer : KHD

Engine : BF 6 L 913

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Inlet press., bar : 1.0

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6,00X2,00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Prestroke mm : 1,9...2,0
 : (1,85...2,05)
Cam sequence : 1-5-3-6-2-4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0,5 (0,75)

BASIC SETTING

M17

1st speed 1/mi: 1100

Contr.-rod trav.mm: 11,0...11,1

Del.quantity cm3/ : 7,8...7,9

Dispersion cm3/ : 0,30

100H.: (0,45)

2nd speed 1/min: 325
Contr.-rod trav. m: 6,8...7,0
Del.quantity cm3/ : 1,0...1,6
Dispersion cm3/ : 0,20
100H.: (0,40)

SLEEVE POSITION

Control-lever position
Degree: -3
Speed 1/min: 800
Contr.-rod travelmm: 0,3...1,0

Governor-spring reload
Notch setting x : -

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
Speed 1/min: 1150
Charge press. hPa : 650
Del.quantity cm3/ : 78,0...79,0
1000H.: (76,0...81,0)

HIGHEST RATED SPEED

1st version
Control-lever
position degrees: 61...69

Testing:
1st c-rod trav.mm : 10,0
Speed 1/min : 1190...1200
2nd c-rod trav.mm : 4,0
Speed 1/min : 1225...1255
4th speed 1/min : 1350
C-rod trav.mm : 0,3...1,7

LOWEST RATED SPEED I

Control-lever
position degrees: 17...25
Setting point w/out aux. spring
Speed 1/min : 325
Contr.-rod trav.mm: 5,0

Testing:
Speed 1/min : 100
C-rod trav.mm min : 19,0
Speed 1/min : 325
C-rod trav.mm : 5,4...5,6
C-rod trav.mm : 2,0
Speed 1/min : 510...570

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500
Pressure hPa : 700
Contr.-rod trav.mm: 12,6...12,8

Measurement

Speed 1/min : 500

1st pressure hPa : 370
C-rod trav.mm : 12,2...12,3
2nd pressure hPa : 90
C-rod trav.mm : 10,6...10,9
C-rod trav.mm : 10,6...10,7

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 650
Speed 1/min : 800
Del.quantity cm3/ : 80,0...82,0
1000H.: (77,5...84,5)
Speed 1/min : 500
Del.quantity cm3/ : 61,0...63,0
1000H.: (58,5...65,5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 120,0...130,0

LOW IDLE

Speed 1/min : 325
Del.quantity cm3/ : 10,0...16,0

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 6,1 D 4
Edition : 15.05.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 876 270
Injection pump
Pump designation : PES6A85D410RS2537
EP type number : 0 410 886 908
Governor
Governor design. : RSV325...1150A8C2020
L
Governor no. : 0 420 232 345

Customer-spec. information
Customer : KHD

Engine : BF6L913

1st version kW : 106.6
Speed 1/min: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00
: (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SP ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 11.00...11.10

Del.quantity cm3/ : 7.9...8.1

100H.: (7.7...8.3)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 325.0

Contr.-rod trav. m: 6.8...7.0

Del.quantity cm3/ : 0.9...1.5

100H.: (0.7...1.7)

Dispersion cm3/ : 0.2

100H.: (0.4)

SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 6.00

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Charge press. hPa : 500

Del.quantity cm3/ : 79.5...81.5

1000H.: (77.5...83.5)

Dispersion cm3/ : 3.00

1000H.: (4.50)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 56...64

Testing:

1st c-rod trav.mm : 10.00

Speed 1/min : 1190...1200

2nd c-rod trav.mm : 4.00

Speed 1/min : 1240...1270

3rd c-rod trav.mm : 4.00

Speed 1/min : 1270...1300

4th speed 1/min : 1435
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever:
position degrees: 20...28
Setting point w/out aux. spring
Speed 1/min : 325
Contr.-rod trav.mm: 6.4

Testing:

Speed 1/min : 100
C-rod trav.mm min : 19.50
Speed 1/min : 325
C-rod trav.mm : 6.80...7.00
C-rod trav.mm : 2.00
Speed 1/min : 590...650

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1150
C-rod trav.mm : 11.00...11.10
2nd speed 1/min : 960
C-rod trav.mm : 11.70...11.90
3rd speed 1/min : 500
C-rod trav.mm : 12.50...12.60

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 500
Pressure hPa : 700
Contr.-rod trav.mm: 12.50...12.60

Measurement

Speed 1/min : 500
1st pressure hPa : -
C-rod trav.mm : 10.60...10.70
2nd pressure hPa : 370
C-rod trav.mm : 12.20...12.30
3rd pressure hPa : 90
C-rod trav.mm : 10.60...10.90

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 500
Speed 1/min : 850
Del.quantity cm3/ : 88.0...91.0
1000H.: (86.0...93.0)
Charge press. hPa : -
Speed 1/min : 500
Del.quantity cm3/ : 60.0...63.0
1000H.: (58.0...65.0)

STARTING FUEL DELIVERY

M20

Speed 1/min : 100
Del.quantity cm3/ : 120.0...130.0
1000H.: (117.0...133.0)
Contr.-rod trav.mm: 17.40...18.00

Remarks:
APPLICATION
Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 W 11
Edition : 30.03.87
Superceeded : 11.84
Calibrating oil : ISO-4113

Combination no. : 0 400 876 325

Injection pump
Pump designation : PES6A90D41ORS2569
EP type number : 0 410 896 071
Governor
Governor design. : RSV350...1200A0B1140
-1L
Governer no. : 0 420 232 430

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM 352

1st version kW : 70.0
Speed 1/min: 2400

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35
: (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1200

Contr.-rod trav.mm: 9.30...9.40

Del.quantity cm3/ : 4.3...4.4

100H.: (4.1...4.6)

Dispersion cm3/ : 0.3

100H.: (0.5)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 8.4...8.6

Del.quantity cm3/ : 1.0...1.6

100H.: (0.7...1.9)

Dispersion cm3/ : 0.2

100H.: (0.4)

SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...1.00

Governor-spring reload

Notch setting x : 3.75

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1200

Del.quantity cm3/ : 43.0...44.0

1000H.: (41.0...46.0)

Dispersion cm3/ : 3.00

1000H.: (5.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 54...62

Testing:

1st c-rod trav.mm : 8.30

Speed 1/min : 1230...1240

2nd c-rod trav.mm : 4.00

Speed 1/min : 1255...1285

3rd c-rod trav.mm : 4.00

Speed 1/min : 1325...1355

4th speed 1/min : 1480

C-rod trav.mm : 0.30...1.70
5th speed 1/min : 1245...1255
C-rod trav.mm : 8.30

LOWEST RATED SPEED I

Control-lever
position degrees: -

Testing:

Speed 1/min : 100
C-rod trav.mm min : 19.50
Speed 1/min : 350
C-rod trav.mm : 8.40...8.60
C-rod trav.mm : 2.00
Speed 1/min : 570...630

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1200
C-rod trav.mm : 9.30...9.40
2nd speed 1/min : 850
C-rod trav.mm : 10.60...10.70
3rd speed 1/min : 950
C-rod trav.mm : 10.30...10.50
4th speed 1/min : 1100
C-rod trav.mm : 9.50...9.70

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 850
Del.quantity cm3/ : 49.0...52.0
1000H.: (46.5...54.5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 78.0...88.0
1000H.: (75.0...91.0)
Contr.-rod trav.mm: 16.10...16.50

Remarks:

APPLICATION
Unimog

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 6,2 0 3
 Edition : 13.05.87
 Superceeded : 12.9.86
 Calibrating oil : ISO-4113
 Combination no. : 0 400 876 327
 Injection pump
 Pump designation : PES6A95D32ORS2693
 EP type number : 0 410 896 914
 Governor
 Governor design. : RSV300...1300AOC2195
 R
 Governor no. : 0 420 233 200

Customer-spec. information
 Customer : DAF

Engine : DNT 620

1st version kW : 130.0
 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)

Contr.-rod trav.mm: 7.50...10.50
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 8.50...9.50
 Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed 1/mi: 850

 Contr.-rod trav.mm: 11.50...11.60

 Del.quantity cm3/ : 7.6...7.7

 100H.: (7.4...7.9)

 Dispersion cm3/ : 0.3

 100H.: (0.4)

2nd speed 1/min: 300.0
 Contr.-rod trav. m: 6.4...6.6
 Del.quantity cm3/ : 0.7...1.1
 100H.: (0.4...1.3)
 Dispersion cm3/ : 0.3
 100H.: (0.5)

SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed 1/min: 800
 Cont.-rod travelmm: 0.30...0.70

Governor-spring reload
 Notch setting x : 6.00

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
 Speed 1/min: 850
 Charge press. hPa : 700
 Del.quantity cm3/ : 76.5...77.5
 1000H.: (74.5...79.5)
 Dispersion cm3/ : 3.50
 1000H.: (4.50)

HIGHEST RATED SPEED

1st version
 Control-lever
 position degrees: 58...66

Testing:

1st c-rod trav.mm : 9.70
Speed 1/min : 1340...1350
2nd c-rod trav.mm : 4.00
Speed 1/min : 1400...1430
3rd c-rod trav.mm : 4.00
Speed 1/min : 1425...1455
4th speed 1/min : 1570
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever
position degrees: 27...35
Setting point w/out aux. spring
Speed 1/min : 300
Contr.-rod trav.mm: 6.0
Speed 1/min : 300
C-rod trav.mm : 6.40...6.60
C-rod trav.mm : 2.00
Speed 1/min : 595...655

TORQUE CONTROL

Torque-control curve - 1st version
1st speed 1/min : 1290
C-rod trav.mm : 10.70...10.80
2nd speed 1/min : 500
C-rod trav.mm : 11.50...11.60
4th speed 1/min : 1050
C-rod trav.mm : 10.90...11.10

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 600
Pressure hPa : 700
Contr.-rod trav.mm: 11.50...11.60

Measurement

Speed 1/min : 600
1st pressure hPa : -
C-rod trav.mm : 11.20...11.40
2nd pressure hPa : 250
C-rod trav.mm : 11.40...11.50

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700
Speed 1/min : 1290
Del.quantity cm³/ : 72.0...74.0
1000H.: (69.5...76.5)
Charge press. hPa : -
Speed 1/min : 600
Del.quantity cm³/ : 65.5...66.5
1000H.: (63.5...68.5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm³/ : 130.0...145.0
1000H.: (127.0...148.0)
Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

Speed 1/min : 300
Contr.-rod trav.mm: 6.40...6.60
Del.quantity cm³/ : 7.0...11.0
1000H.: (4.5...13.5)
Dispersion cm³/ : 3.50
1000H.: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 6,0 C 2
 Edition : 13.05.87
 Superceeded : -
 Calibrating oil : ISO-4113
 Combination no. : 0 400 876 335
 Injection pump
 Pump designation : PES6A90D41ORS2710
 EP type number : 0 410 896 082
 Governor
 Governor design. : RSV350...1200A1C1154
 L
 Governor no. : 0 420 232 468
 Customer-spec. information
 Customer : DAIMLER-BENZ
 Engine : OM 366
 1st version kW : 74.0
 Speed 1/min: 2400

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.00
 Calibrating nozzle-holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test inj. tubing : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 2.25...2.35
 : (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing⁰CS: 0-60-120-180-240-300
Tolerance + - ⁰ : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1200

Contr.-rod trav.mm: 9.30...9.40

Del.quantity cm3/ : 4.8...4.9

100H.: (4.6...5.1)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 8.0...8.6

Del.quantity cm3/ : 1.0...1.2

100H.: (0.8...1.4)

Dispersion cm3/ : 0.2

100H.: (0.4)

SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0.03...1.00

Governor-spring reload

Notch setting x : 5.00

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1200

Del.quantity cm3/ : 48.0...49.0

1000H.: (46.0...51.0)

Dispersion cm3/ : 3.00

1000H.: (4.50)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 59...67

Testing:

1st c-rod trav.mm : 8.30

Speed 1/min : 1240...1245

2nd c-rod trav.mm : 4.00

Speed 1/min : 1261...1274

3rd c-rod trav.mm : 4.00

Speed 1/min : 1300...1330

4th speed 1/min : 1400

C-rod trav.mm : 0.30...1.40
5th speed 1/min : 1255...1265
C-rod trav.mm : 8.30

LOWEST RATED SPEED I

Control-lever

position degrees: ?

Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 350

C-rod trav.mm : 8.20...8.40

C-rod trav.mm : 2.00

Speed 1/min : 465...525

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1200

C-rod trav.mm : 9.30...9.40

2nd speed 1/min : 600

C-rod trav.mm : 10.40...10.60

3rd speed 1/min : 800

C-rod trav.mm : 10.30...10.50

4th speed 1/min : 1000

C-rod trav.mm : 9.40...9.70

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 41.0...43.0

1000H.: (38.5...45.5)

Speed 1/min : 900

Del.quantity cm3/ : 44.0...47.0

1000H.: (41.5...49.5)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 78.0...88.0

1000H.: (75.0...91.0)

Contr.-rod trav.mm: 16.80...17.20

LOW IDLE

Speed 1/min : 350

Contr.-rod trav.mm: 8.00...8.60

Del.quantity cm3/ : 10.0...12.0

1000H.: (8.0...14.0)

Dispersion cm3/ : 2.50

1000H.: (4.50)

Remarks:

APPLICATION

Unimog

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 6,0 C 3
Edition : 13.05.87
Superceeded : 12.9.86
Calibrating oil : ISO-4113

Combination no. : 0 400 876 336

Injection pump
Pump designation : PES6A90D410RS2710
EP type number : 0 410 896 082
Governor
Governor design. : RSV350...1200A1C115
-1L
Governor no. : 0 420 232 470

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 81.0
Speed 1/min: 2400

TEST BENCH REQUIREMENTS

Calibrating-gil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values ----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35
: (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing^oCS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1200

Contr.-rod trav.mm: 9.80...9.90

Del.quantity cm3/ : 5.1...5.2

100H.: (4.9...5.4)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 8.4...8.6

Del.quantity cm3/ : 1.0...1.2

100H.: (0.8...1.4)

Dispersion cm3/ : 0.2

100H.: (0.4)

SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0.30...1.00

Governor-spring reload

Notch setting x : 5.00

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1200

Del.quantity cm3/ : 51.0...52.0

1000H.: (49.0...54.0)

Dispersion cm3/ : 3.00

1000H.: (4.50)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 59...67

Testing:

1st c-rod trav.mm : 8.80

Speed 1/min: 1240...1245

2nd c-rod trav.mm : 4.00

Speed 1/min: 1262...1275

3rd c-rod trav.mm : 4.00

Speed 1/min: 1305...1335

4th speed 1/min: 1400

C-rod trav.mm : 0.30...1.40
5th speed 1/min : 1250...1260
C-rod trav.mm : 8.80

LOWEST RATED SPEED I

Control-lever

position degrees: -3

Setting point w/out aux. spring

Speed 1/min: 350

Contr.-rod trav.mm: 8.50

Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 350

C-rod trav.mm : 8.40...8.60

C-rod trav.mm : 2.00

Speed 1/min : 520...550

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1200

C-rod trav.mm : 9.80...9.90

2nd speed 1/min : 600

C-rod trav.mm : 11.30...11.40

3rd speed 1/min : 850

C-rod trav.mm : 11.10...11.30

4th speed 1/min : 950

C-rod trav.mm : 10.30...10.60

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 48.0...50.0

1000H.: (45.5...52.5)

Speed 1/min : 850

Del.quantity cm3/ : 49.0...52.0

1000H.: (46.5...54.5)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 78.0...88.0

1000H.: (75.0...91.0)

LOW IDLE

Speed 1/min : 350

Contr.-rod trav.mm: 8.10...8.80

Del.quantity cm3/ : 10.0...12.0

1000H.: (8.0...14.0)

Dispersion cm3/ : 2.50

1000H.: (84.50)

Remarks:

APPLICATION

Unimog

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 V 19
Edition : 10.04.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 876 338
Injection pump
Pump designation : PES6A90D410RS2596
EP type number : 0 410 896 073
Governor
Governor design. : RSV300...1100A0C1148
-2L
Governor no. : 0 420 232 477

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM352

1st version kW : 92.0
Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing^oCS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 10.90...11.00

Del.quantity cm3/ : 6.3...6.4

100H.: (6.1...6.6)

Dispersion cm3/ : 0.3

100H.: (0.5)

2nd speed 1/min: 300.0
Contr.-rod trav. m: 8.1...8.3
Del.quantity cm3/ : 0.8...1.4
100H.: (0.6...1.6)
Dispersion cm3/ : 0.2
100H.: (0.4)

SLEEVE POSITION

Control-lever position
Degree: -3
Speed 1/min: 800
Contr.-rod travelmm: 0.30...1.00

Governor-spring reload
Notch setting x : ?

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
Speed 1/min: 1100
Charge press. hPa : 700
Del.quantity cm3/ : 63.5...64.5
1000H.: (61.5...66.5)
Dispersion cm3/ : 3.00
1000H.: (5.00)

HIGHEST RATED SPEED

1st version
Control-lever
position degrees: 44...52

Testing:
1st c-rod trav.mm : 9.90
Speed 1/min : 1140...1150
2nd c-rod trav.mm : 4.00
Speed 1/min : 1190...1220
3rd c-rod trav.mm : 4.00
Speed 1/min : 1220...1250

4th speed 1/min : 1350
C-rod trav.mm : 0.30...1.70

LOWEST RATED SPEED I

Control-lever
position degrees: -3
Setting point w/out aux. spring
Speed 1/min : 300
Contr.-rod trav.mm: 8.20

Testing:

Speed 1/min : 100
C-rod trav.mm min : 19.50
Speed 1/min : 300
C-rod trav.mm : 8.10...8.30
C-rod trav.mm : 2.00
Speed 1/min : 470...530

TORQUE CONTROL

Torque-control curve - 1st version
1st speed 1/min : 1100
C-rod trav.mm : 10.90...11.00
2nd speed 1/min : 750
C-rod trav.mm : 12.60...12.70
3rd speed 1/min : 1000
C-rod trav.mm : 11.50...11.70

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 750
Pressure hPa : 700
Contr.-rod trav.mm: 12.60...12.70

Measurement

Speed 1/min : 750
1st pressure hPa : -
C-rod trav.mm : 11.80...11.90
2nd pressure hPa : 400
C-rod trav.mm : 12.20...12.30

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700
Speed 1/min : 750
Del.quantity cm3/ : 72.5...74.5
1000H.: (70.0...77.0)
Charge press. hPa : -
Speed 1/min : -
Del.quantity cm3/ : 67.0...69.0
1000H.: (64.5...71.5)
Charge press. hPa : -
Speed 1/min : 500
Del.quantity cm3/ : 58.0...60.0
1000H.: (56.0...62.0)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 78.0...88.0

Remarks:
Hydraulic latching of starting
delivery.

Latching at 0.4 bar ... 0.5 bar.

Unlatching at 0.15 bar...0.25 bar.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 1 0 1
Edition : 22.05.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 400 876 344
Injection pump
Pump designation : PES6A95D410RS2625
EP type number : 0 410 896 926
Governor
Governor design. : RSV325...1250A2C1159
L
Governor no. : 0 420 232 490

Customer-spec. information
Customer : KHD

Engine : BF6L913C

1st version kW : 130.0
Speed 1/min: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00
: (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 1250

Contr.-rod trav.mm: 11.60...11.70

Del.quantity cm3/ : 9.3...9.5

100H.: (9.1...9.7)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 6.4...6.6

Del.quantity cm3/ : 1.0...1.6

100H.: (0.7...1.8)

Dispersion cm3/ : 0.3

100H.: (0.5)

SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 4.25

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1250

Charge press. hPa : 900

Del.quantity cm3/ : 93.0...95.0

1000H.: (91.0...97.0)

Dispersion cm3/ : 3.50

1000H.: (6.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 47...55

Testing:

1st c-rod trav.mm : 10.60

Speed 1/min : 1290...1300

2nd c-rod trav.mm : 4.00

Speed 1/min : 1345...1375

3rd c-rod trav.mm : 4.00

Speed 1/min : 1355...1385

4th speed 1/min : 1520
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever
position degrees: 17...25
Setting point w/out aux. spring
Speed 1/min : 350
Contr.-rod trav.mm: 5.0

Testing:

Speed 1/min : 100
C-rod trav.mm min : 19.50
Speed 1/min : 350
C-rod trav.mm : 5.40...5.60
C-rod trav.mm : 2.00
Speed 1/min : 520...580

TORQUE CONTROL

Dimension a mm : 0.40
Torque-control curve - 1st version
1st speed 1/min : 1250
C-rod trav.mm : 11.60...11.70
2nd speed 1/min : 500
C-rod trav.mm : 12.00...12.10
4th speed 1/min : 1105
C-rod trav.mm : 11.70...11.90

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 500
Pressure hPa : 900
Contr.-rod trav.mm: 12.00...12.10

Measurement

Speed 1/min : 500
1st pressure hPa : -
C-rod trav.mm : 10.30...10.40
2nd pressure hPa : 540
C-rod trav.mm : 11.50...11.60
3rd pressure hPa : 420
C-rod trav.mm : 10.80...11.00

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 900
Speed 1/min : 1000
Del.quantity cm3/ : 94.5...97.5
1000H.: (92.0...100.0)
Charge press. hPa : 900
Speed 1/min : 1150
Del.quantity cm3/ : 93.0...96.0
1000H.: (90.5...98.5)
Charge press. hPa : -
Speed 1/min : 500

Del.quantity cm3/ : 54.0...56.0
1000H.: (52.0...58.0)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 120.0...130.0
1000H.: (117.0...133.0)
Contr.-rod trav.mm: 16.30...16.70
APPLICATION
Combine-harvester

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : RAB 10,8 A
Edition : 30.03.87
Superceeded : 5.84
Calibrating oil : ISO-4113

Combination no. : 0 401 276 051

Injection pump
Pump designation : PES6A100D41ORS3039
EP type number : 0 411 206 018
Governor
Governor design. : RSV475...950A1C2121L
Governor no. : 0 420 232 384

Customer-spec. information
Customer : RABA

Engine : D2156 MKTL6

1st version kW : 184.0
Speed 1/min: 1900

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.60...1.70
: (1.55...1.75)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing⁰CS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 950

Contr.-rod trav.mm: 13.60...13.70

Del.quantity cm3/ : 15.2...15.4

100H.: (15.0...15.6)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 475.0

Contr.-rod trav. m: 5.9...6.1

Del.quantity cm3/ : 1.1...1.5

100H.: (0.9...1.8)

Dispersion cm3/ : 0.3

100H.: (0.5)

SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0.30..

Governor-spring reload
Notch setting x : 3.75

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 950

Charge press. hPa : 750

Del.quantity cm3/ : 152.0...154.0

1000H.: (150.0...156.0)

Dispersion cm3/ : 3.00

1000H.: (6.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 45...53

Testing:

1st c-rod trav.mm : 12.60

Speed 1/min : 990...1000

2nd c-rod trav.mm : 4.00

Speed 1/min : 1025...1055

3rd c-rod trav.mm : 4.00

Speed 1/min : 1030...1060
4th speed 1/min : 1195
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever
position degrees: 23...31
Setting point w/out aux. spring
Speed 1/min : 475
Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 100
C-rod trav.mm min : 19.50
Speed 1/min : 475
C-rod trav.mm : 5.90...6.10
C-rod trav.mm : 2.00
Speed 1/min : 570...630
Speed 1/min : 675
C-rod trav.mm max : 1.00

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 950
C-rod trav.mm : 13.60...13.70
2nd speed 1/min : 500
C-rod trav.mm : 15.70...15.80
3rd speed 1/min : 840
C-rod trav.mm : 14.90...15.10

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 500
Pressure hPa : 750
Contr.-rod trav.mm: 15.70...15.80

Measurement

Speed 1/min : 500
1st pressure hPa : -
C-rod trav.mm : 13.40...13.50
2nd pressure hPa : 550
C-rod trav.mm : 15.00...15.10
3rd pressure hPa : 420
C-rod trav.mm : 14.10...14.30

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 750
Speed 1/min : 750
Del.quantity cm3/ : 180.0...184.0
1000H.: (178.0...186.0)
Charge press. hPa : -
Speed 1/min : 500
Del.quantity cm3/ : 0.0...149.0
1000H.: (0.0...151.0)

Remarks:

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 7,1 A 4
Edition : 6.87
Superceeded : 11.86
Calibrating oil : ISO-4113
Combination no. : 0 401 846 505 E
Injection pump
Pump designation : PE6P110A32ORS483E
EP type number : 0 411 816 159
Governor
Governor design. : RQV250...1100PA499-1

Customer-spec. information
Customer : VOLVO

Engine : TD 71

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6,00x1,50x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
: (2.95...3.15)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1-5-3-6-2-4

SD ang. spacing⁰CS: 0-60-120-180-240-300
Tolerance + - : 0.5(0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 11.20...11.30

Del.quantity cm3/ : 10.1...10.3

100H.: (9.8...10.6)

Dispersion cm3/ : 0.4

100H.: (0.75)

2nd speed 1/min: 250

Contr.-rod trav. m: 5.30...5.50

Del.quantity cm3/ : 1.6...2.0

100H.: (-)

Dispersion cm3/ : 0.3

100H.: (0.6)

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1200

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700

Charge press. hPa : 900

Del.quantity cm3/ : 101.0...103.0

1000H.: (98.0...106.0)

Dispersion cm3/ : 4.0

1000H.: (7.5)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 54...62

Testing:

1st c-rod trav.mm : 10.20

Speed 1/min : 1160...1170

2nd c-rod trav.mm : 4.00

Speed 1/min : 1260...1290

4th speed 1/min : 1400

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 5...13

Testing:

Speed 1/min : 100
C-rod trav.mm min : 6.80
Speed 1/min : 250
C-rod trav.mm : 5.30...5.50

CONSTANT REGULATION

Speed 1/min : 300...410

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500
Pressure hPa : 900
Contr.-rod trav.mm: 11.20...11.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
C-rod trav.mm : 8.70...8.90
2nd pressure hPa : 560
C-rod trav.mm : 11.0...11.1
3rd pressure hPa : 290
C-rod trav.mm : 9.1...9.3

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 900
Speed 1/min : 1000
Del.quantity cm3/ : 110.0...114.0
1000H.: (107.0...117.0)
Charge press. hPa : -
Speed 1/min : 700
Del.quantity cm3/ : 68.0...70.0
1000H.: (65.0...73.0)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 170.0...200.0
1000H.: (-)
Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Speed 1/min : 250
Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm3/ : 16.0...20.0
1000H.: (-)
Dispersion cm3/ : 3.0
1000H.: (6.0)

Remarks:

Delivery-valve spring pre-tension =
2.40...2.60 mm.

N10

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 12.0 S
Edition : 12.06.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 401 846 529
Injection pump
Pump designation : PE6P120A32ORS3186
EP type number : 0 411 826 756
Governor
Governor design. : RQV250..1025PA657-13
Governor no. : 0 421 813 592

Customer-spec. information
Customer : VOLVO

Engine : TD102F

1st version kW : 220.0
Speed 1/min: 2050

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Perforated-plate
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70
 : (2.55...2.75)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing^oCS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

SD mark cyl. nō. : 1

BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 11.40...11.50

Del.quantity cm3/ : 19.7...19.9

100H.: (19.4...20.2)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 3.9...4.1

Del.quantity cm3/ : 1.7...2.2

100H.: (1.4...2.4)

Dispersion cm3/ : 0.5

100H.: (0.7)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 250

Sleeve travel mm: 1.20...1.30

2nd speed 1/min: 430

Sleeve travel mm: 3.50...3.80

3rd speed 1/min: 700

Sleeve travel mm: 6.40...6.60

4th speed 1/min: 900

Sleeve travel mm: 6.40...6.60

5th speed 1/min: 1080

Sleeve travel mm: 8.30...8.50

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1080

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700

Charge press. hPa : 1000

Del.quantity cm3/ : 197.0...199.0
1000H.: (194.0...202.0)
Dispersion cm3/ : 5.00
1000H.: (9.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 58...66

Testing:

1st c-rod trav.mm : 10.40

Speed 1/min : 1055...1065

2nd c-rod trav.mm : 4.00

Speed 1/min : 1110...1140

4th speed 1/min : 1250

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 4..12

Testing:

Speed 1/min : 100

C-rod trav.mm min : 5.40

Speed 1/min : 250

C-rod trav.mm : 3.90...4.10

CONSTANT REGULATION

Speed 1/min : 250...350

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 1000

Contr.-rod trav.mm: 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 8.90...9.10

2nd pressure hPa : 770

C-rod trav.mm : 11.20...11.30

3rd pressure hPa : 420

C-rod trav.mm : 9.40...9.60

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -

Speed 1/min : 700

Del.quantity cm3/ : 149.0...151.0

1000H.: (146.0...154.0)

LOW IDLE

Speed 1/min : 250

Contr.-rod trav.mm: 3.90...4.10

Del.quantity cm3/ : 17.0...22.0
1000H.: (14.5...24.5)
Dispersion cm3/ : 5.00
1000H.: (7.00)

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 11,6 X2
Edition : 10.04.87
Superceeded : -
Calibrating oil : ISO-4113
Combination no. : 0 401 846 540
Injection pump
Pump designation : PE6P110A320RS407-1
EP type number : 0 411 816 147
Governor
Governor design. : RQ275/1000PA861
Governor no. : 0 421 801 397

Customer-spec. information
Customer : DAF

Engine : LT 195

1st version kW : 195.0

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per value: -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 600

Contr.-rod trav.mm: 12.80...12.90

Del.quantity cm3/ : 15.3...15.5

100H.: (15.0...15.7)

Dispersion cm3/ : 0.4

100H.: (0.7)

2nd speed 1/min: 275.0

Contr.-rod trav. m: 7.2...7.4

Del.quantity cm3/ : 1.4...1.9

100H.: (1.1...2.1)

Dispersion cm3/ : 0.4

100H.: (0.7)

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 600

Contr.-rod travelmm: 15.40...16.60

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 600

Charge press. hPa : 700

Del.quantity cm3/ : 153.0...155.0

1000H.: (150.5...157.5)

Dispersion cm3/ : 4.00

1000H.: (7.50)

HIGHEST RATED SPEED

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 16.0

Testing:

1st c-rod trav.mm : 11.40

Speed 1/min : 1030...1045

2nd c-rod trav.mm : 4.00

Speed 1/min : 1100...1130

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 73...81

Setting point w/out aux. spring
Speed 1/min : 275
Contr.-rod trav.mm: 7.3

Testing:

Speed 1/min : 100
C-rod trav.mm min : 8.40
Speed 1/min : 275
C-rod trav.mm : 7.20...7.40
C-rod trav.mm : 2.50
Speed 1/min : 340...380

TORQUE CONTROL

Dimension a mm : 0.25
Torque-control curve - 1st version
1st speed 1/min : 600
C-rod trav.mm : 13.00...13.10
2nd speed 1/min : 980
C-rod trav.mm : 12.40...12.60
3rd speed 1/min : 900
C-rod trav.mm : 12.50...12.80

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 600
Pressure hPa : 700
Contr.-rod trav.mm: 12.80...12.90

Measurement

Speed 1/min : 600
C-rod trav.mm : 11.70...11.90
2nd pressure hPa : 340
C-rod trav.mm : 12.50...12.60
3rd pressure hPa : 310
C-rod trav.mm : 12.10...12.30

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700
Speed 1/min : 980
Del.quantity cm3/ : 145.5...149.5
1000H.: (142.5...152.5)
Speed 1/min : 600
Del.quantity cm3/ : 130.0...132.0
1000H.: (127.5...134.5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 245.0...285.0
1000H.: (241.0...289.0)
Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

N15

Speed 1/min : 275
Contr.-rod trav.mm: 7.20...7.40
Del.quantity cm3/ : 14.0...19.0
1000H.: (11.5...21.5)
Dispersion cm3/ : 4.50
1000H.: (7.50)

Remarks:

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 11,6 X3
 Edition : 02.06.87
 Superceeded : -
 Calibrating oil : ISO-4113
 Combination no. : 0 401 846 541
 Injection pump
 Pump designation : PE6P110A320RS407-1
 EP type number : 0 411 816 147
 Governor
 Governor design. : RQ275/1100PA864
 Governor no. : 0 421 801 400

Customer-spec. information
 Customer : DAF

Engine : LT 210

1st version kW : 210.0
 Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set constant delivery quant.
 per values -----

START OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 600

 Contr.-rod trav.mm: 12.90...13.00

 Del.quantity cm3/ : 15.5...15.7

 100H.: (15.2...15.9)

 Dispersion cm3/ : 0.4

 100H.: (0.7)

 2nd speed 1/min: 275.0
 Contr.-rod trav. m: 7.2...7.4
 Del.quantity cm3/ : 1.4...1.9
 100H.: (1.1...2.1)
 Dispersion cm3/ : 0.4
 100H.: (0.7)

SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed 1/min: 600
 Cont.-rod travelmm: 15.20...16.40

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version
 Speed 1/min: 600
 Charge press. hPa : 700
 Del.quantity cm3/ : 155.0...157.0
 1000H.: (152.5...159.5)
 Dispersion cm3/ : 4.00
 1000H.: (7.50)

HIGHEST RATED SPEED

Setting point:
 Speed 1/min : 600
 Contr.-rod trav.mm: 15.8

Testing:
 1st c-rod trav.mm : 11.50
 Speed 1/min : 1135...1150
 2nd c-rod trav.mm : 4.00
 Speed 1/min : 1180...1210
 4th speed 1/min : 1300
 C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 275
Contr.-rod trav.mm: 7.3

Testing:

Speed 1/min : 100
C-rod trav.mm min : 8.40
Speed 1/min : 275
C-rod trav.mm : 7.20...7.40
C-rod trav.mm : 2.00
Speed 1/min : 350...390

TORQUE CONTROL

Dimension a mm : 0.25
Torque-control curve - 1st version
1st speed 1/min : 600
C-rod trav.mm : 13.10...13.20
2nd speed 1/min : 1080
C-rod trav.mm : 12.50...12.70
3rd speed 1/min : 850
C-rod trav.mm : 12.80...12.90

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 600
Pressure hPa : 700
Contr.-rod trav.mm: 12.90...13.00

Measurement

Speed 1/min : 600
1st pressure hPa : -
C-rod trav.mm : 11.70...11.90
2nd pressure hPa : 310
C-rod trav.mm : 12.60...12.70
3rd pressure hPa : 270
C-rod trav.mm : 12.10...12.30

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700
Speed 1/min : 1080
Del.quantity cm3/ : 147.0...151.0
1000H.: (144.0...154.0)
Charge press. hPa : -
Speed 1/min : 600
Del.quantity cm3/ : 130.0...132.0
1000H.: (127.5...134.5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 245.0...285.0
1000H.: (241.0...289.0)
Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

Speed 1/min : 275
Contr.-rod trav.mm: 7.20...7.40
Del.quantity cm3/ : 14.0...19.0
1000H.: (11.5...21.5)
Dispersion cm3/ : 4.50
1000H.: (7.50)

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 11,6M14
Edition : 02.06.87
Superceeded : -
Calibrating oil : ISO-4113

Combination no. : 0 401 846 542

Injection pump
Pump designation : PE6P100A320RS384-1
EP type number : 0 411 806 189
Governor
Governor design. : RQ225/1000PA868
Governor no. : 0 421 801 403

Customer-spec. information
Customer : DAF

Engine : DKDL 1160 SB 220

1st version kW : 220.0
Speed 1/min: 2000

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
 : (3.15...3.35)
Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

BASIC SETTING

1st speed 1/mi: 600

Contr.-rod trav.mm: 11.40...11.50

Del.quantity cm3/ : 9.8...10.0

100H.: (9.6...10.2)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 7.5...7.7

Del.quantity cm3/ : 0.9...1.3

100H.: (0.6...1.5)

Dispersion cm3/ : 0.3

100H.: (0.5)

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 550

Cont.-rod travelmm: 15.20...16.40

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 600

Del.quantity cm3/ : 98.0...100.0

1000H.: (96.0...102.0)

Dispersion cm3/ : 3.50

1000H.: (6.00)

HIGHEST RATED SPEED

Setting point:

Speed 1/min : 550

Contr.-rod trav.mm: 15.8

Testing:

1st c-rod trav.mm : 9.60

Speed 1/min : 1045...1060

2nd c-rod trav.mm : 4.00

Speed 1/min : 1100...1130

4th speed 1/min : 1250

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 250

Contr.-rod trav.mm: 7.6

Testing:

Speed 1/min : 100
C-rod trav.mm min : 8.40
Speed 1/min : 250
C-rod trav.mm : 7.50...7.70
C-rod trav.mm : 2.00
Speed 1/min : 345...385

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 600
C-rod trav.mm : 11.40...11.50
2nd speed 1/min : 1000
C-rod trav.mm : 10.60...10.80
3rd speed 1/min : 820
C-rod trav.mm : 11.20...11.40
4th speed 1/min : 900
C-rod trav.mm : 10.80...11.10

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1000
Del.quantity cm3/ : 93.0...97.0
1000H.: (90.5...99.5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 180.0...220.0
1000H.: (176.0...224.0)
Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

Speed 1/min : 250
Contr.-rod trav.mm: 7.50...7.70
Del.quantity cm3/ : 9.0...13.0
1000H.: (6.5...15.5)
Dispersion cm3/ : 3.50
1000H.: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 11,0 R5
Edition : 30.03.87
Superceeded : 1.83
Calibrating oil : ISO-4113
Combination no. : 0 401 846 734
Injection pump
Pump designation : PE6P110A72ORS3040
EP type number : 0 411 816 713
Governor
Governor design. : RQV200...1000PA555
Governor no. : 0 421 813 280

Customer-spec. information
Customer : SCANIA

Engine : DS11 14

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40
: (3.25...3.45)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 600

Contr.-rod trav.mm: 13.60...13.70

Del.quantity cm3/ : 17.5...17.7

100H.: (17.3...17.9)

Dispersion cm3/ : 0.6

100H.: (0.8)

2nd speed 1/min: 225.0

Contr.-rod trav. m: 4.4...4.6

Del.quantity cm3/ : 1.7...2.1

100H.: (-)

Dispersion cm3/ : 0.2

100H.: (0.4)

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1050

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 600

Charge press. hPa : 700

Del.quantity cm3/ : 175.0...177.0

1000H.: (173.0...179.0)

Dispersion cm3/ : 6.00

1000H.: (8.00)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 56...64

Testing:

1st c-rod trav.mm : 12.60

Speed 1/min : 1040...1050

2nd c-rod trav.mm : 4.00

Speed 1/min : 1150...1180

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 5...13

Testing:

Speed 1/min : 100
C-rod trav.mm min : 5.90
Speed 1/min : 225
C-rod trav.mm : 4.40...4.60
C-rod trav.mm : 2.00
Speed 1/min : 320...380

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500
Pressure hPa : 700
Contr.-rod trav.mm: 13.60...13.70

Measurement

Speed 1/min : 500

1st pressure hPa : -
C-rod trav.mm : 11.70...11.80
2nd pressure hPa : 410
C-rod trav.mm : 13.20...13.30
3rd pressure hPa : 260
C-rod trav.mm : 12.20...12.40

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700
Speed 1/min : 1000
Del.quantity cm3/ : 169.5...174.5
1000H.: (167.0...177.0)
Charge press. hPa : -
Speed 1/min : 500
Del.quantity cm3/ : 127.0...131.0
1000H.: (125.0...133.0)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 240.0...290.0
1000H.: (-)
Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Speed 1/min : 225
Contr.-rod trav.mm: 4.40...4.60
Del.quantity cm3/ : 17.0...21.0
Dispersion cm3/ : 2.00
1000H.: (4.00)

Remarks:

ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see
VDT-I-400/116.

For sealing see VDT-I-400/117.

Start of delivery - engine: 20° before
TDC
Firing sequence of engine:
1-5-3-6-2-4.

Scania test specifications taken over
on Aug. 30, 1984

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,0 M
Edition : 21.5.87
Superceeded : 12.9.86
Calibrating oil : ISO-4113
Combination no. : 0 401 846 741
Injection pump
Pump designation : PE6P110A320 S3814
EP type number : 0 411 816 721
Governor
Governor design. : RQV350...1150PA378R
Governor no. : 0 421 813 294

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM421

1st version kW : 159.0
Speed 1/min: 2300
2nd version kW : 159.0
Speed 1/min: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...110

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6,00X1,50X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

N22

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10
: (3.95...4.15)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 6- 3- 5- 2- 4- 1

SD ang. spacing⁰CS: 0-45-120-165-240-285
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 12.70...12.80

Del.quantity cm3/ : 13.4...13.6
100H.: (13.1...13.8)

Dispersion cm3/ : 0.4
100H.: (0.8)

2nd speed 1/min: 350
Contr.-rod trav. m: 8.2...8.4
Del.quantity cm3/ : 1.3...1.9
100H.: (1.0...2.1)
Dispersion cm3/ : 0.4
100H.: (0.8)

1st speed 1/min: 1130
Contr.-rod trav.mm: 12.7...12.8
Del.quantity cm3/ : 12.3...12.5
100H.: (-)
Dispersion cm3/ : 0.4
100H.: (0.7)

2nd speed 1/min: 350
Contr.-rod trav.mm: 8.20...8.40
Del.quantity cm3/ : 1.3...1.9
100H.: (-)
Dispersion cm3/ : 0.4
100H.: (0.7)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 300
Sleeve travel mm: 0.60...0.90
2nd speed 1/min: 580
Sleeve travel mm: 3.60...3.70
3rd speed 1/min: 870
Sleeve travel mm: 5.20...5.30
4th speed 1/min: 1150
Sleeve travel mm: 7.60

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1150

Cont.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Del.quantity cm3/ : 134.0...136.0

1000H.: (131.5...138.5)

Dispersion cm3/ : 4.00

1000H.: (8.00)

2nd version

Speed 1/min: 1130

Del.quantity cm3/ : 123.0...125.0

1000H.: (120.0...128.0)

Dispersion cm3/ : 4.0

1000H.: (8.0)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 62...70

Testing:

1st c-rod trav.mm : 11.70

Speed 1/min : 1180...1190

2nd c-rod trav.mm : 4.00

Speed 1/min : 1285...1315

3rd c-rod trav.mm : 1400

Speed 1/min : 0.00...1.00

2nd version

Control-lever

position degrees: 62...70

Testing:

1st c-rod trav.mm : 11.70

Speed 1/min : 1180...1190

2nd c-rod trav.mm : 4.00

Speed 1/min : 1285...1315

3rd c-rod trav.mm : 1400

Speed 1/min : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 12...20

Testing:

Speed 1/min : 100

C-rod trav.mm min : 8.50

Speed 1/min : 350

C-rod trav.mm : 8.20...8.40

CONSTANT REGULATION

Speed 1/min : 375...485

SWITCH-OVER POINT

Speed 1/min : 270 (290)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 113.0...117.0

1000H.: (110.0...120.0)

Dispersion cm3/ : 6.00

1000H.: (9.00)

Speed 1/min : 1150

Del.quantity cm3/ : 93.0...97.0 *

1000H.: (90.0...100.0)

Dispersion cm3/ : 6.00

1000H.: (9.00)

Speed 1/min : -

Del.quantity cm3/ : -

1000H.: (-)

Remarks:

Version 1: Without return-flow restriction

Version 2: With return-flow restriction

* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 10,0 0
Edition : 12.06.87
Superceeded : 12.9.86
Calibrating oil : ISO-4113
Combination no. : 0 401 846 745
Injection pump
Pump designation : PE6P110A32ORS3080
EP type number : 0 411 816 722
Governor
Governor design. : RQV250...1100PA589
Governor no. : 0 421 813 307

Customer-spec. information
Customer : VOLVO

Engine : TD100GA

TEST BENCH REQUIREMENTS

Calibrating-oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
: (3.45...3.65)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 12.30...12.40

Del.quantity cm3/ : 16.7...16.9

100H.: (16.4...17.2)

Dispersion cm3/ : 0.4

100H.: (0.7)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 3.8...4.0

Del.quantity cm3/ : 1.5...1.9

100H.: (1.2...2.1)

Dispersion cm3/ : 0.3

100H.: (0.6)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 250

Sleeve travel mm: 1.20...1.30

2nd speed 1/min: 370

Sleeve travel mm: 2.60...3.00

3rd speed 1/min: 430

Sleeve travel mm: 3.50...3.90

4th speed 1/min: 1160

Sleeve travel mm: 8.10...8.30

5th speed 1/min: 1210

Sleeve travel mm: 9.40...9.60

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1180

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700

Charge press. hPa : 900

Del.quantity cm3/ : 167.0...169.0

1000H.: (164.0...172.0)

Dispersion cm3/ : 4.00

1000H.: (7.50)

HIGHEST RATED SPEED

1st version

Control-lever
position degrees: 59...67

Testing:

1st c-rod trav.mm : 11.30
Speed 1/min : 1160...1170
2nd c-rod trav.mm : 4.00
Speed 1/min : 1220...1250
4th speed 1/min : 1350
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever
position degrees: 4...12

Testing:

Speed 1/min : 100
C-rod trav.mm min : 5.30
Speed 1/min : 250
C-rod trav.mm : 3.80...4.00

CONSTANT REGULATION

Speed 1/min : 270...380

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500
Pressure hPa : 900
Contr.-rod trav.mm: 12.30...12.40

Measurement

Speed 1/min : 500

1st pressure hPa : -
C-rod trav.mm : 9.80...9.90
2nd pressure hPa : 610
C-rod trav.mm : 12.10...12.20
3rd pressure hPa : 280
C-rod trav.mm : 10.10...10.30

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -
Speed 1/min : 700
Del.quantity cm3/ : 121.0...124.0
1000H.: (118.5...126.5)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 160.0...190.0
1000H.: (156.0...196.0)
Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

N25

Speed 1/min : 250
Contr.-rod trav.mm: 3.80...4.00
Del.quantity cm3/ : 15.0...19.0
1000H.: (12.5...21.5)
Dispersion cm3/ : 3.00
1000H.: (6.00)

Remarks:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 10,0 Q5
Edition : 13.05.87
Superceeded : 6.85
Calibrating oil : ISO-4113
Combination no. : 0 401 846 753
Injection pump
Pump designation : PE6P110A32ORS3108
EP type number : 0 411 816 727
Governor
Governor design. : RQV325...1100PA232
Governor no. : 0 421 813 309

Customer-spec. information
Customer : VOLVO-BM

Engine : TD100G

TEST BENCH REQUIREMENTS

Calibrating-pil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set constant delivery quant.
per values -----

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
: (2.95...3.15)

Contr.-rod trav. mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing⁰CS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav. mm: 11.50...11.60

Del. quantity cm³/ : 14.8...15.0

100H.: (14.5...15.3)

Dispersion cm³/ : 0.4

100H.: (0.8)

2nd speed 1/min: 325.0

Contr.-rod trav. m: 3.9...4.1

Del. quantity cm³/ : 1.6...2.0

100H.: (1.3...2.2)

Dispersion cm³/ : 0.3

100H.: (0.6)

(B) Setting of injection pump with
externally-mounted governor

SLEEVE TRAVELS

1st speed 1/min: 325

Sleeve travel mm: 1.60...1.70

2nd speed 1/min: 500

Sleeve travel mm: 2.80...3.20

3rd speed 1/min: 800

Sleeve travel mm: 5.00...5.20

4th speed 1/min: 1100

Sleeve travel mm: 7.60...7.80

5th speed 1/min: 1200

Sleeve travel mm: 8.70...9.00

SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1175

Cont.-rod travel mm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700

Charge press. hPa : 700

Del. quantity cm³/ : 148.0...150.0

1000H.: (145.0...153.0)

Dispersion cm³/ : 4.00

1000H.: (8.00)

HIGHEST RATED SPEED

1st version

Control-lever
position degrees: 40...48

Testing:
1st c-rod trav.mm : 10.50
Speed 1/min : 1140...1150
2nd c-rod trav.mm : 4.00
Speed 1/min : 1220...1250
4th speed 1/min : 1350
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever
position degrees: 7...15

Testing:
Speed 1/min : 100
C-rod trav.mm min : 5.40
Speed 1/min : 325
C-rod trav.mm : 3.90...4.10
C-rod trav.mm : 2.00
Speed 1/min : 340...400

compensator (LDA,ADA,ALDA)

1st version

Setting
Speed 1/min : 500
Pressure hPa : 700
Contr.-rod trav.mm: 11.50...11.60

Measurement
Speed 1/min : 500

1st pressure hPa : -
C-rod trav.mm : 9.70...9.80
2nd pressure hPa : 500
C-rod trav.mm : 11.30...11.40
3rd pressure hPa : 300
C-rod trav.mm : 10.00...10.20

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -
Speed 1/min : 700
Del.quantity cm3/ : 115.0...117.0
1000H.: (112.0...120.0)

STARTING FUEL DELIVERY

Speed 1/min : 100
Del.quantity cm3/ : 170.0...200.0
1000H.: (156.0...204.0)
Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Speed 1/min : 325

N27

Contr.-rod trav.mm: 3.90...4.10
Del.quantity cm3/ : 16.0...20.0
1000H.: (13.5...22.5)
Dispersion cm3/ : 3.00
1000H.: (6.00)

Remarks: